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STEEL

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Contents

Volume 105—No. 10 **September 4, 1939**

READER COMMENTS 9
AS THE EDITOR VIEWS THE NEWS 13
NEWS
Whither Tax Reform? 15
Steel Demand, Prices Strong with Hostilities Opening in Europe 17
Steel Imports Down 8.4 Per Cent 18
Light Steel Products Gain 19
Meetings 19
August Pig Iron Output Rises 13.5 Per Cent 20
What's New at Pittsburgh 21
Steelworks Operations for Week 21
First Half Pig Iron Output Up 58.3 Per Cent 22
Engineering Congress Canceled as War Keeps Foreign Delegates Home 23
Men of Industry 24
Obituaries 25
Aviation 29
WINDOWS OF WASHINGTON 26
MIRRORS OF MOTORDOM 32
EDITORIAL—Industry and the Neutrality Law 34
THE BUSINESS TREND
Industrial Activity Resists Adverse Foreign Influences 35
Charts and Statistics 36-37
FORUM ON RE-EMPLOYMENT 38
TECHNICAL
Rolled Threads for Hollow Metal Articles 40
HEAT TREATING
Improved Tempering 42
MATERIALS HANDLING
Carburizing Compound 48
STAMPING
Overload Control 52
PROGRESS IN STEELMAKING
Flash Trimmers 54
POWER DRIVES
Gearmotor Drives 59
JOINING AND WELDING
Engine Parts 62
INDUSTRIAL EQUIPMENT 66
MARKET REPORTS AND PRICES 71
The Market Week 72
BEHIND THE SCENES 82
CONSTRUCTION AND ENTERPRISE 92
INDEX TO ADVERTISERS 98

DESPITE FIRE, CHEMICALS AND STRESS...

...ECONOMICAL SATISFACTORY SERVICE RECORDS

Eight years' service instead of two was the saving to a large chemical company for specifying Nickel cast iron in this 8 ton ring. Plain iron used here corroded and eroded ½" per year. This Nickel alloyed iron wears less than ⅛" in the same time. The Straight Line Foundry and Machine Co., Syracuse, N. Y., used a 3% Nickel cast iron for these rings. Nickel induces a close-grained, pressure-tight structure which machines easily, resists corrosion and abrasion.

FROM NICKEL CAST IRONS

Sintering sulphide ores subjects cast iron grates to intense heat and to corrosive action of hot sulphur gases. Grates also suffer severe shock each cycle dropping down to discharge ore. Seeking to reduce grate costs, alternate pallets in one Dwight-Lloyd furnace were fitted with plain iron and Nickel cast iron. During this test a 4-to-1 superiority for Nickel cast iron was established! Recently new grates of Nickel-strengthened iron were ordered from Robert Mitchell, Ltd., Montreal. Nickel helps metals resist heat and acid as effectively as it minimizes stress and abrasion.

New 6,000 Ton Press! Believed to be the world's largest bending press, this 2,000,000 lb. monster was recently completed by the Baldwin-Southwark Corp., Phila. Actually twin 3,000 ton presses joined top and bottom, this huge unit easily forms 8" x 40' steel plates for the Combustion Engineering Co., Chattanooga. The 50" rams were made from a Nickel-chromium cast iron with a tensile strength of 55,000 p.s.i. Cast by the Cramp Brass and Iron Foundry, this Nickel iron, with a Brinell hardness of 250, machined easily to a fine, smooth finish. No job is too big for Nickel's help.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N.Y.

As the Editor Views the News

■ STEEL production last week advanced (p. 21) to 64 per cent of ingot capacity, a new high level for this year. Despite threats of a major European war (p. 71) steel demand seems slated for further upturn early in September. Automotive demand is gathering momentum in connection with 1940 models. Railroad awards are larger than in some time. Scrap is strong. Pig iron shipments are larger, partly to avoid shortages at consuming plants should the European situation develop unexpected demands. While the present underlying strength makes unlikely the industrial demoralization of the first few months of the World war, a large-scale European war would bring vital questions in connection with our foreign trade, and our neutrality policy (p. 34) undoubtedly would be revised.

• • •

National Defense

Now in the spotlight is the war resources board, headed by Edward R. Stettinius Jr., chairman, United States Steel Corp., which would exercise supreme wartime control of industry, with responsibility only to the President. It now (p. 26) is mapping strategies to be followed in emergencies of any kind, so as to maintain industrial morale, prevent confusion, curb excessive increases in wages, cost of living, profits . . . Whether our shipbuilding program should be stepped up in the interest of the national defense is a live question (p. 26) at Washington; a survey reveals existing shipbuilding capacity is not being utilized fully. . . . Bakelite Corp. is taken over (p. 29) by Union Carbide & Carbon Corp.; Chain Belt Co. (p. 20) acquires Baldwin-Duckworth Chain Corp.

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Views on Tax Reform

Hundreds of businessmen (p. 15) have accepted the treasury department's invitation to present their views as to tax law changes that would cause business expansion. Hearings in closed sessions will start Sept. 5. The treasury department will listen sympathetically and transmit the views of business to congress. The big question is: What will congress do? . . . National resources committee, consisting of administration officials, urges creation (p. 26) of a federal agency to conserve power and fuel resources for defense and recovery. . . Special house committee to investigate the national labor relations board (p. 28) will hold an organization meeting Sept. 7. . . "Light" steel products (p. 19) accounted for 45.7 per cent of total output during the first six months of this year.

• • •

How To Make Jobs

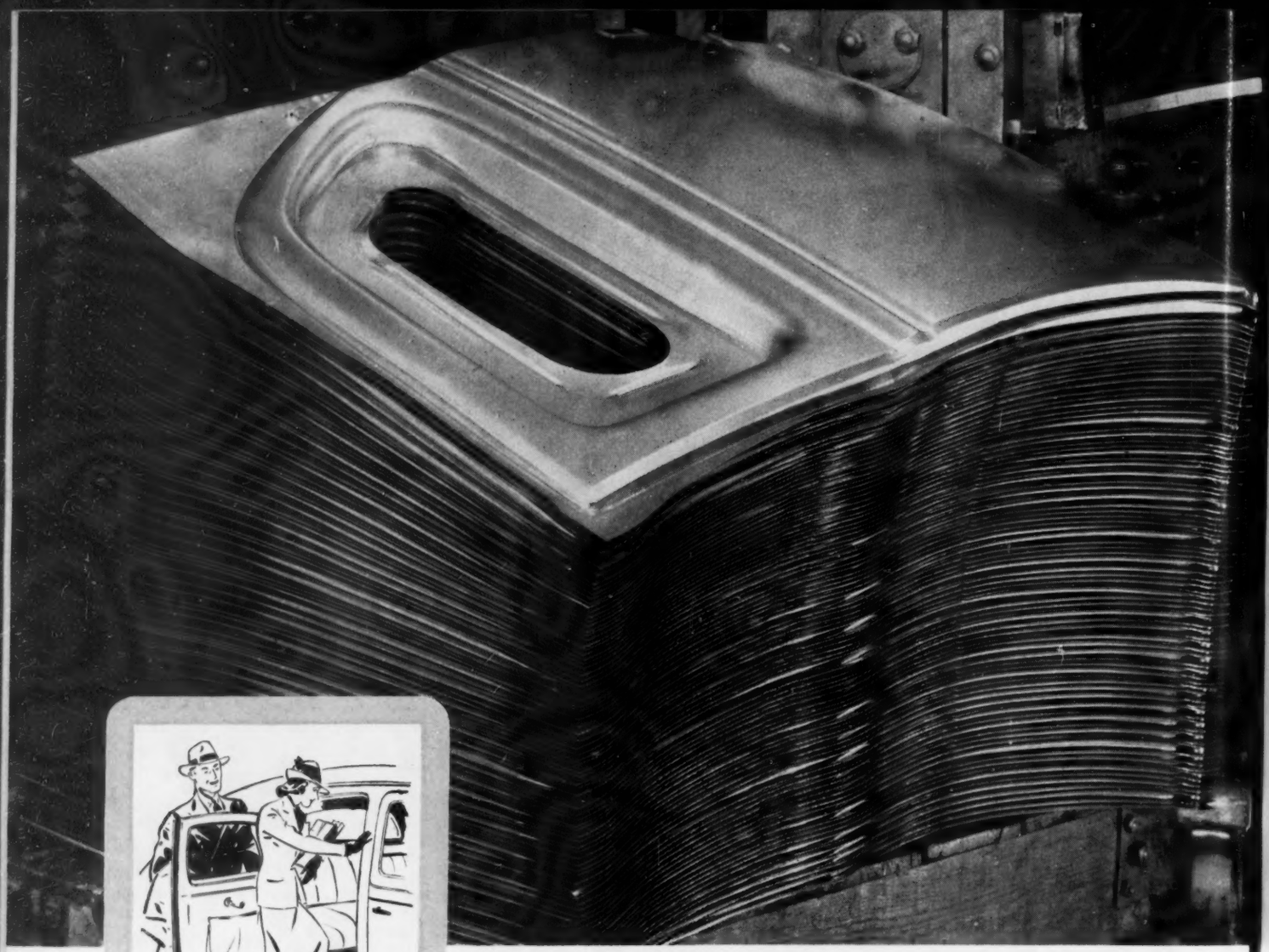
This week's contributor to STEEL's Forum on Re-Employment (p. 38) is Benton H. Grant, youthful leader who has received much credit for last year's Republican victory in Connecticut. He thinks that unemployment can be eliminated through proper government co-operation in providing a frame-work in which private industry could accelerate its paces. . . . Rolled threads (p. 40) may be applied to hollow metal products by a newly developed process adapted for high speed and volume production; the threads may be rolled both on inside and outside surfaces. . . . Gear-motor drives, because they are simple, compact and totally enclosed, says an authority (p. 59), warrant wider use for all low-speed drives up to 75-horsepower; he explains his reasons why.

• • •

Speeding Output

First commercial installation of the austempering process for treating steel now (p. 42) is in successful operation at the Worcester, Mass., plant of American Steel & Wire Co. . . . Improved flash trimmers in continuous pickler and cold mill lines (p. 54) incorporate advantageous features; they are faster and compensate for coil stock of different thicknesses . . . An unusual system is used in handling carburizing compound at a shop which heat treats by the pack method; it permits notable economies (p. 48) in the amount of compound consumed and facilitates packing of the parts to be treated. . . . New controls prevent damage to dies and press mechanism (p. 52) in event two or more pieces are fed into a press instead of the single thickness for which the dies may be set.

E C Kreutzberg



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SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

Whither Tax Reform?

■ WHAT can industry expect from the study of the federal tax structure now being undertaken by the treasury department for the house ways and means subcommittee? What tax reforms will be recommended by businessmen and organizations in response to Acting Treasury Secretary John W. Hanes' invitations for views?

Extent of tax reform to be undertaken by congress at its next session obviously can be only conjecture. Certain it is, however, that the treasury department, and subsequently the house subcommittee, will have the benefit of business' best thinking on needed tax revisions. Included among the 1000 organizations and individuals invited to present their views are associations and companies whose experts have made intensive studies of the tax situation.

That they are responding wholeheartedly to the opportunity to place their views before the treasury department is attested by Mr. Hanes, who last week said hundreds of businessmen already had signified their willingness to co-operate, and have pledged active support. "Without exception," he asserted, "they come with good will and constructive intent."

Tax hearings will open before the treasury department Sept. 5. All will be in executive session. Complete transcripts of the hearings will be presented to the ways and means committee Nov. 1. Names of those testifying and their statements will not be disclosed at present.

■ John Wesley Hanes' efforts to get business-labor-government co-operation on taxes make brighter the prospects for tax revisions at the next session of congress. His program does not necessarily imply lower taxes, but rather contemplates modernization of the entire tax structure, an effort "to work out a tax revision program which will further improve the laws relating to individual and corporation taxes." Business' reaction is favorable

Need for thorough revision of United States tax laws long has been recognized by business. The present system, like Topsy, "just growed," resembling in many respects a crazy quilt. Certain levies now on the books act to discourage enterprise and employment, have constituted a barrier to recovery.

What business thinks should be done to improve the tax structure is fairly well defined. Business favors simplification of tax laws and their administration, and seeks elimination of punitive and deterrent levies. It believes taxation should be primarily for revenue, not for reform.

Probable recommendations:

1—Longer carryover period for losses. The 1939 revenue act provides net losses may be carried over for two years. While this was a step in the right direction, many industrialists, especially those in the capital goods industries, where there are sharp cyclical fluctuations, believe the period should be longer. In the case of "feast or famine" industries the present tax law sometimes operates as a periodic capital levy. To avoid this, Great Britain allows carryover of loss for a period of six years.

2—Permission to corporations to file consolidated returns in the same manner as under federal law prior to 1934. This would permit losses of a pioneering subsidiary to be offset by earnings of well-established units and encourage corporations to undertake venturesome enterprises.

3—Relief of intercorporate dividends from taxation.

4—Elimination of double taxation of dividends.

5—Elimination of capital stock tax.

6—Reasonable allowances for depreciation. Business complains that depreciation allowances under present tax laws are not in accord with practical accounting principles.

7—Elimination of tax on capital gains. In judgment of many authorities the capital gains tax has done more to discourage private enterprise than any other factor in the tax structure. Whether the reduction effected last year in this tax was great enough to encourage long-

term risk-taking has not yet been demonstrated.

8—Widening the personal income tax base. While controversial, many tax experts believe the middle classes should pay a larger share; to this end, recommend lowering exemptions and increasing income tax rates in lower brackets.

9—Removal of tax exemptions on public salaries. It is widely felt that all exemptions should be removed in view of the large number now on public payrolls and the pressing need for additional revenue.

10—Reduction in individual surtax rates to encourage investment in venturesome enterprises. This probably should be accompanied by the abolition of tax-exempt securities. It is contended persons with high income should be those to invest in enterprises where the risk is great and there is possibility of large return. With surtax rates as high as 79 per cent, persons with upper bracket incomes find it more profitable to invest in safe low-interest-bearing tax-exempt bonds, than to risk their capital in venturesome enterprises. Even though return on the latter is large, the high surtax leaves little for the investor.

Effect on Large Incomes

Mr. Hanes recently cited the example of a person with a $1,000,000 income. This taxpayer, he said, would need a private investment with a yield of 12½ per cent in order to make as much money, after paying taxes, as he would receive from an investment in 3 per cent tax-exempts.

11—Long-term planning of tax policy to eliminate present complexity and uncertainty. No secret has it been that investors have shied away from putting money in new enterprises for fear of what turn the administration's tax policy might take.

These and other suggestions will be laid before treasury department officials for transmission to the house subcommittee. How will they be received by congress?

Encouraged by the small beginning made during the last session in eliminating remnants of the undistributed profits tax and providing certain other relief, many industrialists believe considerable progress in tax reform will result from the current study. It is pointed out that congress made but little concession when it determined to permit the undistributed profits tax to expire according to statute provision. For at the same time the treasury department strengthened section 102 of the 1938 revenue act, under which taxes may be levied on undistributed corporate earnings if in the internal revenue commissioner's opinion these are being "unreasonably" accumulated to avoid payment of personal surtaxes.

While the 1939 tax relief act admittedly meant little in the way of actual reductions, it will afford savings in time and money by eliminating necessity for figuring the surtax.

Also promising is the administration's forced retreat from the theory of punitive taxation. The undistributed profits tax, for example, was never designed as a revenue measure. Its purpose was to force business to act as the administration wanted it to act.

Treasury Report Significant

Still another favorable omen is the support being given the revision program by the treasury department. Judging from the mood of congress during closing days of the last session, and allowing for what is likely to be heard from the home folks during recess, it is probable the representatives will lend receptive ears to the treasury department's proposals next winter.

Reportedly to arouse interest in its tax reform program, the treasury department last week issued a tax history for the period 1932-1938.

Report revealed tax revenues of federal, state and local governments for the fiscal year 1938 were 79.6 per cent greater than in the fiscal year 1932. Annual expenditures increased by 44 per cent from 1932 to 1938.

Figures were part of the first comprehensive overall picture of federal, state and local fiscal operations presented by the federal government.

The treasury estimated total federal, state and local tax collections in the 1938 fiscal year amounted to $14,811,000,000. This would be $114.09 per capita based on an estimated population of 129,818,000. Sum is equivalent to 21.8 per cent of the estimated national income.

Largest single item of revenue was property taxes totaling $4,745,000,000, or 32 per cent of the nation's total tax bill.

During the 1938 fiscal year all general government expenditures, including debt retirement, totaled $18,199,000,000, of which $1,005,000,000 was net addition to social security reserves. Federal government disbursements accounted for $7,626,000,000; state governments, $4,223,000,000; local governments, $5,621,000,000.

"To pay for all general governmental disbursements," the treasury bulletin said, "taxes are estimated to have furnished $14,811,000,000, nontax revenues $1,181,000,000, borrowings $1,869,000,000 and reductions in general fund balances $338,000,000. Of the total $15,992,000,000 revenue, the federal government collected $6,242,000,000, the states collected $4,202,000,000 and local governments collected $5,548,000,000."

Sources of federal, state and local revenues for the fiscal year 1938:

(In Millions of Dollars)

Source	Amount	Pct.
Customs	359	2.4
Property	4,745	32.0
Individual income	1,562	10.6
Estate, inheritance and gift	562	3.8
Corporate income and privileges	1,762	12.0
Payrolls	1,450	9.8
Motor fuel and vehicle	1,481	10.0
Liquor and tobacco	1,466	9.9
Sales and other excises	1,306	8.8
Other tax revenue	118	0.7
Total	14,811	100.0

How federal, state and local governments expended funds from their own resources as distinguished from grants is shown in an accompanying table.

Taxes on corporate income and corporate privileges were the second most important in volume. Third were income taxes.

"For the federal government, the three most important sources of current revenue were the taxes on corporation income and privileges, on individual income, and on liquor and tobacco. Collections in 1938 from each of these three sources exceeded a billion dollars.

"For state governments, the automotive taxes were by far the most important. In 1938 this group, in-

Government Spending, Fiscal Year 1938

(In Millions of Dollars)

Function	Federal	State	Local	Total
1. Education	177	818	1,418	2,413
2. Highways and streets	260	900	510	1,670
3. Agriculture and natural resources	1,000	73	3	1,076
4. National defense	1,610	12	...	1,622
5. Police and other protection	44	138	566	748
6. Relief, welfare and social security	2,182	637	266	3,085
7. Net additions to social security reserves	489	516	...	1,005
Social security reserves	(574)	(707)	...	(1,281)
Withdrawals included (6) above	(85)	(191)	...	(276)
8. Health and hospitals	36	270	265	571
9. Interest	926	121	592	1,639
10. All other	902	738	2,001	3,641
Total expenditure	7,626	4,223	5,621	17,470
Debt retirement	65	135	529	729
Total disbursement, including debt retirement	7,691	4,356	6,150	18,199

cluding motor fuel taxes, motor vehicle registration fees and drivers' licenses (excluding the personal property taxes on automobiles), yielded a total of $1,163,000,000. Next in importance was the sales and other excise group, which produced $717,000,000.

"The most important expenditure category for all units in the fiscal year 1938 was relief, welfare, and social security. It accounted for an estimated $3,085,000,000. This includes funds expended for work relief programs, which in part were devoted to highways, public buildings, and other functional purposes. Net additions to social security reserves amounted to an additional $1,005,000,000.

"Next in importance came education, highways and streets, interest and national defense, including payments to war veterans and their dependents."

Has Educational Value

While the treasury's report is interpreted as a preliminary to federal tax reform, it may likewise serve to educate the public to reforms needed in state and local tax structures.

In considering necessary revisions in the nation's taxing setup, experts point out, it must be kept in mind that a wholly sound tax structure will not be attained so long as the federal economy remains unsound. Budgets cannot be balanced when business is below normal. In the last analysis, they assert, no fiscal system will prove adequate unless it promotes the full flow of productive energies.

War Board Pledged Aid By Scrap Institute

■ Full co-operation and support was pledged to the new war resources board by the Institute of Scrap Iron and Steel Inc. during its annual midyear meeting at Cleveland, Aug. 28-29. Delegates authorized such action by their board of directors.

Attended by more than 100, this was the largest midyear meeting in the institute's history, according to E. C. Barringer, executive secretary. At a session of its public relations committee plans were formulated for publication of an institute statistical yearbook. Chapter welfare committee approved a standard set of bylaws and procedural rules to be adopted by the 19 chapters.

Organization's traditional golf tournament was held the afternoon of Aug. 29. Meeting was closed that evening with a dinner at Hotel Statler where golf awards and door prizes were distributed.

Steel Demand, Prices Strong with Hostilities Opening in Europe

NEW YORK

■ OUTBREAK of European hostilities finds September steel demand expanding, with indications for further pickup later in the year.

While sentiment is dampened in some directions, no check in domestic buying is anticipated. Mills probably will be called on to supply more material for an accelerated rearmament program at home. Railroads, oil producers and other vital factors in national defense are certain to scrutinize their equipment needs with increasing care.

Despite possible revision of our present neutrality policies, it is unlikely any heavy munitions orders will come from abroad within the next few weeks. England and France are understood to be well supplied, with their munitions plants operating at capacity. Probability, however, is for greater purchases of machinery and pig iron. Substantial blanket inquiries for steel developed from abroad late last week, but sellers were not disposed to quote without specifications.

Export business is certain to derive additional benefit as neutrals divert orders from belligerents.

Steel export quotations are strong, with semifinished prices already increasing modestly. Currently soaring war risk insurance rates make increases in ocean shipping costs a certain eventuality.

HOW STRATEGIC MINERALS POSITION CHANGED IN 20 YEARS

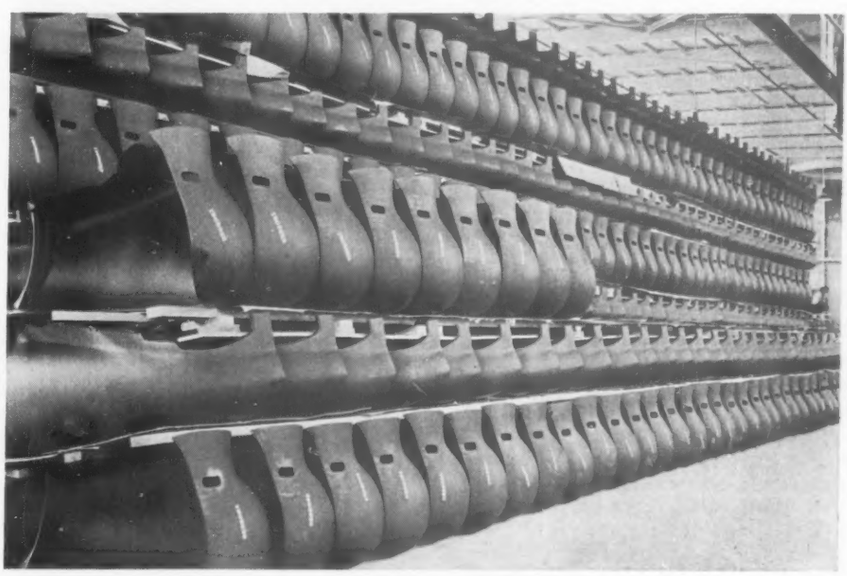
During the 20 years since the close of the World war, the strategic minerals position of the United States has been improved in some respects, although aggravated in others, said Dr. John W. Finch, director, bureau of mines, in an address last week before the American Mining congress, Salt Lake City, Utah.

The nation is no longer vitally dependent on Chile for nitrates, since a substantial part of our consumption is supplied by synthetic material made from atmospheric nitrogen, Dr. Finch said.

The United States now produces a large part of its requirements of potash and possesses sufficient capacity to supply all its needs if necessary. Domestic production of platinum has increased materially as a result of recent new operations in Alaska. Molybdenum is now produced in abundant quantities, and reserves of vanadium apparently are adequate to take care of expanding production under favorable prices.

During the World war, our chem-

Fenders Instead of Guns



■ **Activity in foreign industrial plants echoes the hymn of hate as guns, ammunition and other implements of war pour forth to waiting armies. In sharp contrast is this view of hundreds of automobile fenders lined up in the new Buick service and parts building in Flint, Mich., waiting the call of American motorists whose cars may be bumped but not bombed**

ical industry existed to a very large extent on Spanish pyrites, but today domestic pyrite production has been increased substantially and our domestic sulphur industry has grown to major proportions and maintains stocks sufficient to guarantee two years' consumption, Dr. Finch said.

We are no longer dependent on Asiatic sources of antimony, owing to the establishment of a smelter at Laredo, Tex., which is equipped to supply large tonnages of antimony derived from Mexican ores.

Improved technology in the treatment of some low-grade deposits of strategic minerals has contributed much to this country's improved position. These as yet have not resulted in any peace-time developments, but they should be of inestimable value in emergency exploitation of sub-marginal resources.

These accomplishments have eased considerably our strategic position in the minerals mentioned, but unfortunately the rapid increase in the use of alloys has made us more dependent than ever on foreign sources of manganese, chromium, and nickel, Dr. Finch pointed out. The situation in these materials has been further aggravated by the depletion of the very limited high-grade reserves of manganese and chrome ores during the last war and, in the case of nickel, by the transfer of refining operations from the United States to Canada.

Since 1923, manufacturers of aluminum in this country have obtained much of their ore from South American bauxite deposits, and we still depend on foreign tin supplies.

May Utilize Low Grade Deposits

In the light of present knowledge, the outlook for disclosing large deposits of deficient strategic minerals of present commercial grade is admittedly not promising, Dr. Finch said. The prospect becomes more hopeful, however, when viewed from the objective of disclosing reserves for strategic purposes that need not necessarily be of immediate commercial grade, but might be commercial under the stimulus of war prices or of strategic value when price would be relatively unimportant. Thus, relatively small deposits of commercial grade may be accompanied by much larger "halos" of lower grade material that contain sufficient quantities of needed metal that could be extracted "at a price."

It is expected that investigations of areas known to contain deposits of strategic minerals will be continued during the course of the 4-year program provided by the strategic minerals act. It is believed these investigations will lead to the designation of additional individual deposits for exploration.

Steel Imports Down 8.4 Per Cent

■ IRON and steel imported into the United States in July, excluding scrap, totaled 27,516 gross tons valued at $1,285,390, compared with June imports of 30,050 tons valued at $1,487,504, a drop of 8.4 per cent according to figures of the metals and minerals division, department of commerce. In July, 1938, imports totaled only 14,094 tons valued at $955,215.

For seven months imports were 189,707 tons valued at $11,326,548, against 131,909 tons valued at $8,377,092 in the comparable period in 1938.

Pig iron was the largest item of imports, 6189 tons, including 3816 tons from British India and 1636 tons from the Netherlands. Plain structural shapes were second with 4867 tons, of which 3999 tons were from Belgium and 855 tons from France. Canada supplied 3868 tons of total spiegeleisen imports of 3873 tons. Belgium sent 1732 tons of 2318 tons of cotton ties. Ferromanganese imports totaled 1985 tons. Norway contributed 1322 tons and the Netherlands 2205 tons.

Belgium was the largest supplier, with 9879 tons, Canada second with 4833 tons, followed by India with 3816 tons, Germany 2332 tons and the Netherlands 2205 tons.

Scrap imports totaled 3335 tons valued at $33,568, compared with June imports of 2537 tons valued at $23,745.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL
Gross Tons

	1939		1938	
	Exports	Imports	Exports	Imports
Jan.	362,672	27,664	586,294	29,631
Feb.	359,690	19,149	460,640	19,589
March	474,360	25,369	526,883	11,827
April	394,008	44,083	489,202	21,237
May	532,641	28,142	540,639	20,814
June	588,856	32,587	312,021	15,887
July	513,664	30,851	263,699	14,728
Aug.	.....	.....	242,139	20,041
Sept.	.....	.....	346,068	27,958
Oct.	.....	.....	425,431	26,445
Nov.	.....	.....	469,596	27,627
Dec.	.....	.....	490,095	28,767
Total	.....	.....	5,152,707	264,551

U. S. IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS
Gross Tons

Articles	July 1939	June 1939	Jan. thru July,'38
Pig iron	6,189	4,276	22,043
Sponge iron	107	262	978
Ferromanganese (1)	1,985	2,494	20,493
Spiegeleisen	3,873	5,792	17,842
Ferrochrome (2)	18	3	111
Ferrosilicon (3)	78	151	874
Other ferroalloys (4)	30	.....	162
Ingots, blooms, etc.	.....	.....	4
Billets	20	79	225
Bars, concrete	20	399	2,000
Hollow bar, drill steel	206	96	842
Bars, solid or hollow	1,406	2,092	11,860
Iron slabs	.....	.....	.....
Iron bars	88	37	401
Wire rods	727	782	5,738
Boiler and other plate	1	14	20
Sheets, skelp, saw pl.	243	57	1,276
Die blocks or blanks	.....	.....	80
Tin plate, taggers' tin	1	12	37
Structural shapes	4,867	5,183	30,742
Sashes and frames	.....	.....	5
Sheet piling	.....	.....	462
Rails and fastenings	271	1,341	4,498
Cast-iron pipe and ftgs.	14	36	401
Mall. iron pipe ftgs.	6	78	108
Welded pipe	278	280	3,900
Other pipe	131	400	24,377
Cotton ties	2,318	1,032	3,383
Other hoops and bands	1,556	1,849	12,446
Barbed wire	1,612	1,883	11,870
Round iron, steel wire	97	128	1,395
Tele. and telephone wire	.....	.....	2
Flat wire and strips	238	261	1,808
Wire rope and strand	141	116	1,196
Other wire	82	125	1,198
Nails, tacks, staples	838	735	5,741
Bolts, nuts, rivets	3	3	66
Horse and mule shoes	42	7	245
Castings and forgings	30	47	878
Total	27,516	30,050	189,707
Iron and steel scrap	3,335	2,537	18,138
GRAND TOTAL	30,851	32,587	207,845

(1) Manganese content; (2) chrome content; (3) silicon content; (4) alloy content.

ORIGIN OF JULY IMPORTS
Gross Tons

	Iron ore	Pig iron	Manganese ore	Ferromanganese
Norway	30,893	.....	.....	1,322
Sweden	2,884	.....	.....	.....
United Kingdom	48	.....	.....	.....
Canada	188	737	.....	.....
Mexico	62	.....	.....	.....
Cuba	32,122	.....	5,835	.....
Chile	155,825	.....	.....	.....
Netherlands	.....	1,636	.....	475
British India	.....	3,816	483	.....
France	.....	.....	29	188
Soviet Russia	.....	.....	202	.....
Gold Coast	.....	.....	17,601	.....
Total	222,022	6,189	24,150	1,985

	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
Belgium	236	3,999	1,222	1,132
United Kingdom	4	12	32	.....
Canada	1	1	2	.....
Sweden	2	.....	69	.....
France	.....	855	53	33
Germany	.....	.....	8	391
Total	243	4,867	1,406	1,556

Canada's Output Gains

■ Canada's production of steel ingots, castings and pig iron in July was slightly larger than in June, and considerably higher than in July, 1938. Ferroalloys showed a sharp drop for the same period. For seven months ending with July there was a considerable decline in production as compared with the same interval last year. Comparisons:

	Steel ingots, castings	Pig iron	Ferroalloys
	(Gross Tons)		
July, 1939	111,149	59,587	6,475
June, 1939	107,902	52,805	10,015
July, 1938	83,927	51,238	4,129
Seven Mos. 1939	691,290	356,108	37,379
Seven Mos. 1938	754,668	455,396	37,288

Light Steel Products Gain

■ "LIGHT" steel products, used chiefly in the manufacture of consumers' goods, comprised 45.7 per cent of total finished steel produced or shipped in the first six months this year, according to an analysis by the American Iron and Steel institute.

The proportion of light products shipped during the half year was higher than in any first half since 1935. In the first six months of 1938, light steel products represented 44.1 per cent of the total tonnage produced for sale or shipped.

The railroad and automotive industries took relatively more of the total steel tonnage in the first half of 1939 than in the corresponding 1938 period.

The tonnage of rails, track equipment and car wheels and axles shipped in the 1939 half year was over 1,037,000 gross tons, or 7.3 per cent of total shipments as against 6.6 per cent of the total in the corresponding 1938 period.

More Sheet, Strip

Shipments of sheet and strip steel, alloy bars and cold-finished carbon steel bars, of which the automobile industry is the largest single consumer, totaled 3,916,000 tons in the first half of this year, or 27.4 per cent of total shipments. Shipments of the same classes of products in the first half of 1938 were 21.8 per cent of the total.

A total of 3,314,000 gross tons of structural shapes, plates, concrete reinforcing bars, galvanized sheets, nails and other steel products used largely by the construction industries represented 23.2 per cent of the total in the first half of this year as against 24.9 per cent in the first half of 1938.

Shipments of barbed wire, woven wire fencing and bale ties also constituted a smaller proportion of the total in the first six months of 1939 compared with a year ago. The total of 259,000 tons of those products shipped represented 1.8 per cent of the half-year total, compared with 2.1 per cent for the first half of 1938.

Tin plate and tin mill black plate shipments totaled 1,135,000 gross tons in the first half of this year, or 8 per cent of the total.

Bar Iron Rate Steady

■ Western Bar Iron association and Amalgamated Association of Iron, Steel and Tin Workers have continued the August card rate for September at 2.15c for boiling, bar and 12-inch mills and 2.25c for guide and 10-inch mills.

The rate was lowered in July from 2.20c and 2.30c in June, a cut of 25 cents per ton for puddling.

MEETINGS

WILL DISCUSS NONFERROUS AND STEEL REFRACTORIES

■ REFRACTORIES division, American Ceramic society, announces the program for its autumn meeting at the Oakland Beach hotel, Conneaut Lake, Pa., Sept. 8-9. Two technical sessions are scheduled, the first on the morning of Sept. 8 will deal with special refractories in the nonferrous industries and the second on the morning of Sept. 9 with special refractories in the steel industries.

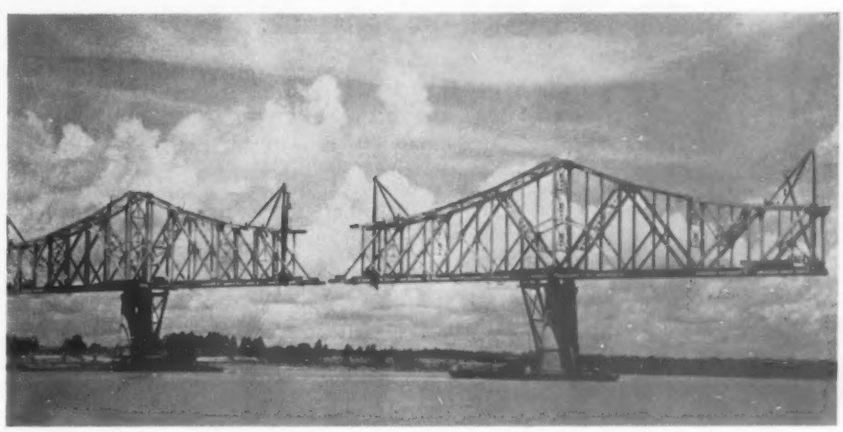
The nonferrous session will feature the following papers: "Nonferrous Refractories," by G. S. Diamond, Electro Refractories & Alloys Corp., Buffalo; "Refractories Used in Wyatt Induction Furnaces Melting Copper, Brass, Nickel-Silver and Other Alloys," by S. H. Booth, American Brass Co., Ansonia, Conn.; "Observations on Refractories Used in Melting and Holding Furnaces for Aluminum," by H. O. Burrows, Aluminum Co. of America, Cleveland; "Report on Refractories in World's Largest Copper Smelting Furnace," by W. B. Boggs, Noranda Mines Ltd., Noranda, Que.; "High Temperature Chemical Reactions Viewed by Moving Picture Camera," by G. J. Easter, research department, Carborundum Co.

Papers for the steel session are: "Field for Special Refractories in the Open Hearth," by L. A. Smith, Jones & Laughlin Steel Corp., Aliquippa, Pa.; "Refractories Used in High-Frequency Electric Melting of Steel and Alloys," by B. W. Magalis, Babcock & Wilcox Co., Barberton, O.; "Refractory Life in Electric Arc Melting of Steel and Alloys," by J. H. Chivers, Pittsburgh; "Correlation of Physical and Chemical Properties of Stopper Heads with Open-Hearth Service," by J. A. Sarandria, Electro Refractories & Alloys Corp., Buffalo.

CHICAGO MANAGEMENT GROUP PLANS MOTION STUDY CLINIC

Industrial Management society of Chicago is sponsoring a national motion and time study clinic at the Medinah club in that city, Nov. 3-4. This event will be similar to the one held last year. Headquarters are 205 West Wacker drive, Chicago.

Novel Method of Erection in Mississippi Span



■ Joining of the central span of the $8,500,000 highway and railway bridge being built by Bethlehem Steel Co. across the Mississippi at Baton Rouge, La., was only a handshake distant when this photograph was taken. It has now been closed.

Precious to joining of the 650-foot central span, each section jutted out nearly 325 feet, supported by the counter-balancing weight of the unfinished section of the adjacent span. "Teeter-board" balanced construction of this general nature has frequently been employed, but not without falsework bents in the river to broaden the base over which the halves are balanced. At Baton Rouge, however, the Mississippi's violent scouring action when at flood stage led the engineers to devise a more novel and seemingly bolder plan of erection.

Span sections as they are shown rest on the permanent piers of the bridge, sunk in the river's bottom 170 feet below normal water level.

The over-all length of the bridge without approaches is 3326 feet divided into five spans. Bridge requires 19,600 tons of steel, will be completed by June, 1940.

Pig Iron Output Up 13.5 Per Cent

■ PRODUCTION of coke pig iron in the United States during August registered a further significant increase with nine more stacks added.

Average daily output, according to producers' reports estimated for the last day or two of the month, was 86,211 gross tons, 10,210 tons, or 13.5 per cent, more than the July average of 76,001 tons. It was the highest since October, 1937, when average was 93,259. In August last year, output averaged 48,242 tons daily.

Total in August was 2,672,542 gross tons, an increase of 316,506 tons, or 13.5 per cent, over the 2,356,036 tons made in July. This total was largest monthly figure since October, 1937, with 2,891,026 tons, and compares with 1,495,514 tons made in August, a year ago.

MONTHLY IRON PRODUCTION

Gross Tons

	1939	1938	1937
Jan.	2,175,423	1,444,862	3,219,741
Feb.	2,060,183	1,306,333	3,020,006
March	2,393,255	1,470,211	3,470,470
April	2,055,326	1,388,008	3,400,636
May	1,717,522	1,260,937	3,545,180
June	2,119,422	1,060,747	3,115,302
July	2,356,036	1,213,076	3,501,359
Aug.	2,672,542	1,495,514	3,616,954
Tot. 8 mo.	17,549,709	10,639,688	26,889,648
Sept.	.....	1,683,097	3,417,960
Oct.	.....	2,067,499	2,891,026
Nov.	.....	2,286,661	2,007,031
Dec.	.....	2,212,718	1,503,474
Total	.....	18,889,663	36,709,139

Output for first eight months this year was 17,549,709 tons, 6,910,021 tons, or 65 per cent, over 10,639,688 tons made in like period of 1938. In the first eight months of 1937, the total was 26,889,648 tons.

Relating production to capacity, operations in August averaged 62.5 per cent, highest since October, 1937, with 68.4 per cent. Rate for July was 55 per cent and for August, a year ago, 34.8 per cent.

Stacks in blast August 31 totaled 139, largest since October, 1937, with 151. This was nine more than at close of July and compared with 117 in June, 105 in May and 102 in April. In August, one merchant and 10 steelworks furnaces were made active and two of the latter class were blown out or banked. August, 1938, saw 88 in operation at end of month.

Furnaces blown in during August were: In Illinois: One South Works Old, Carnegie-Illinois Steel Corp. In Indiana: Gary No. 1, Carnegie-Illinois Steel Corp. In Michigan: One Detroit, National Steel Corp. In Ohio: Ohio No. 4, Carnegie-Illinois Steel Corp.; One Anna, Struthers Iron & Steel Co. In Pennsylvania:

AVERAGE DAILY PRODUCTION

Gross Tons

	1939	1938	1937	1936
Jan.	70,175	46,608	103,863	65,461
Feb.	73,578	46,655	107,857	63,411
March	77,201	47,426	111,951	66,004
April	68,511	46,267	113,354	80,316
May	55,404	40,675	114,360	85,795
June	70,647	35,358	103,843	86,551
July	76,001	39,131	112,947	83,735
Aug.	86,211	48,242	116,676	87,475
Sept.	.....	56,103	113,932	90,942
Oct.	.....	66,694	93,259	96,509
Nov.	.....	76,222	66,901	98,331
Dec.	.....	71,378	48,499	100,813
Ave.	72,221	51,752	100,573	83,832

Cambria "K", Bethlehem Steel Co.; Duquesne No. 5 and Edgar Thomson "F", Carnegie-Illinois Steel Corp.; Eliza Nos. 3 and 6, Jones & Laughlin Steel Corp.; One Swede, Alan Wood Steel Co.

Stacks blown out or banked were: In Alabama: Pioneer No. 2 Republic Steel Corp. In Ohio: One Trumbull-Cliffs, Trumbull Cliffs Furnace Co.

Bethlehem Steel Co. advises that its Bethlehem F furnace, Bethlehem, Pa., did not blow out in July as reported but remained in blast during August. Consequently STEEL has revised the total number of stacks active on July 31 from 129 to 130.

AUGUST IRON PRODUCTION

	No. in blast last day of		Total tonnage	
	Aug.	July	Merchant	Nonmerchant
Alabama	14	15	77,231	129,976*
Illinois	8	7	17,627	189,866
New York	9	9	53,410	136,768
Ohio	34	33	64,194	600,902*
Penna.	42	36	45,313*	692,376*
Colorado	2	2	12,420*	464,557
Indiana	11	10		
Maryland	6	6		
Virginia	1	1		
Kentucky	2	2	27,650	160,252
Mass.	1	1		
Michigan	4	3		
Minnesota	1	1		
Missouri	0	0		
Tenn.	0	0		
Utah	1	1		
West Va.	3	3		
Total	139	130	297,845*	2,374,697*

*Includes ferromanganese and spiegeleisen.

Baldwin-Duckworth, Chain Belt in Merger

■ Chain Belt Co., Milwaukee, has acquired the business and all net assets of Baldwin-Duckworth Chain Corp., Springfield, Mass. Plan of acquisition, which is in effect a merger, provides for issuance to Baldwin-Duckworth stockholders of 139,537.5 shares of no par common stock of Chain Belt Co.

To provide this stock, Chain Belt stockholders authorized an additional 140,000 shares to bring the total shares authorized to 500,000.

Merger grew out of a selling arrangement between the two firms. Chain Belt has marketed finished roller chain made for it by Baldwin-Duckworth, and wished to assure itself of a permanent source of supply. There is little overlapping of products, Chain Belt never having manufactured any of the principal products of Baldwin-Duckworth. Thus, Chain Belt's line is rounded out by addition of finished roller and automotive timing chains, cut tooth sprockets, flexible couplings and certain types of light conveyor chains.

RATE OF FURNACE OPERATION

(Relation of Production to Capacity)

	1939[1]	1938[2]	1937[3]	1936[4]
Jan.	51.0	33.6	76.6	48.2
Feb.	53.5	33.6	79.5	46.4
March	56.1	34.2	82.5	48.5
April	49.8	33.4	83.7	59.1
May	40.2	29.4	84.3	63.1
June	51.4	25.5	76.6	63.6
July	55.0	28.2	82.9	61.5
Aug.	62.5	34.8	85.7	64.3
Sept.	....	40.5	83.7	66.9
Oct.	....	48.0	68.4	71.0
Nov.	....	55.0	49.3	72.3
Dec.	....	51.4	35.6	74.2

[1] Based on capacity of 50,198,920 gross tons, Dec. 31, 1938; [2] capacity of 50,606,400 gross tons, Dec. 31, 1937; [3] first half on capacity of 49,512,737 tons, Dec. 31, 1936—second half on capacity of 49,727,737 tons, June 30, 1937; [4] capacity of 49,777,893 tons, Dec. 31, 1935. Capacities by American Iron and Steel Institute.

The newly acquired plants at Springfield and Worcester, Mass., will retain their identity and will be known as Baldwin-Duckworth, division of Chain Belt Co. George H. Empsall, Frank J. Weschler and George D. Gilbert all directors of the former Baldwin-Duckworth Chain Corp. were elected directors of Chain Belt Co. In addition Mr. Empsall and Mr. Weschler were elected vice presidents of the company. Mr. Weschler was also appointed general manager of the Baldwin-Duckworth division. Mr. George Gilbert, general sales manager of the Baldwin-Duckworth division.

■ National Industrial Advertisers association has granted a charter to the Industrial Marketers of Southern California, third new chapter to be added within the past 12 months. California chapter officers: President, Richard O'Mara, sales and advertising manager, Western Precipitation Corp.; vice president, Don Mack, advertising manager, Weber Showcase and Fixture Co.; secretary-treasurer, Martin R. Klitten, account executive, The McCarty Co.

What's New at Pittsburgh . . .

By R. L. HARTFORD
Pittsburgh Editor, STEEL

■ CARNEGIE-ILLINOIS STEEL CORP. last week consolidated management of its Pittsburgh district sheet operations by placing H. G. McIlvried in charge, as general superintendent, of the Vandergrift works in addition to his post as general superintendent of Irvin works. This change, effective Sept. 1, makes the Vandergrift unit a part of Irvin works. L. S. Dahl was named assistant general superintendent while J. H. Elliott and D. C. Buchanan were named assistants to the general superintendent. F. J. Christie will be superintendent of the Vandergrift plant.

Vandergrift has an interesting history. In 1885 founder Geo. G. McMurtry of the Apollo Iron & Steel works, conceived the idea of a planned town free of the stigmas so generally associated with company towns. Calling in the services of F. L. Olmstead, designer of the Chicago Columbian exposition, McMurtry had his town ready in 1895. This is regarded as one of the earliest examples of a complete industrial relations program. Health facilities were emphasized, and the town was controlled by the employes. Houses were built by the employes themselves, and even today 80 per cent of the homes are owned by the workers.

The Apollo company was merged shortly thereafter with the American Tin Plate Co., which in turn became a part of the American Sheet & Tin Plate Co. after the formation of the United States Steel Corp. American Sheet & Tin later was merged with Carnegie-Illinois.

Recently the Vandergrift plant has been producing specialty sheet products, including plain and formed galvanized materials, electrical sheets and alloy steel sheets. Combination of this unit with Irvin works, which produces hot and cold-rolled sheets and tin plate, gives the Carnegie company a complete sheet unit in the Pittsburgh district, consolidated under one management.

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Oil Country Buying Restricted

Oil production restrictions have been felt by industries here more than appears on the surface. Oil country suppliers have been receiving cancellations and holdups on orders since the initial shutdowns. This applies more to specialties than to drill pipe and casing, although there has been a marked effect in the tubular goods. Warehouse sales in the affected districts have declined considerably and there now is some question whether or not this drop will be made up when the ban is lifted.

Sellers of oil country goods are concerned over the effects of the shutdown in the final analysis more than the immediate effects on current orders. It is regarded as highly possible in oil country circles that a federal control system to prorate production on a national basis and limit the amount of drilling activity is in the offing. It is obvious that several state governments are desirous of this since the tremendous exploitation of Illinois oil following attempts of southwestern states to control production.

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Lighting More Stacks

Carnegie-Illinois Steel Corp. has added No. 5 blast furnace at the Duquesne works, making three active stacks there. Twenty-seven stacks now are active in the district, and indications are more soon will be blown in. Pig iron stocks are reported low and at least one company has had to convert blast furnace capacity from merchant activity to steelworks supply to take care of expanding ingot rates.

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Orders Turbogenerators

Weirton Steel Co. has ordered a $300,000 turbogenerator from Allis Chalmers Mfg. Co. to supply added power in connection with the Weirton expansion program. New unit will supply 10,000 kilowatts at 3600 revolutions per minute. Part of the output will be required for the enlarged hot mill and new cold mills which are on the boards. Two new buildings are under construction at the company's strip steel mill in Weirton, and construction is well under way on the company's new laboratory.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Sept. 2	Change	Same week 1938	Same week 1937
Pittsburgh	59	+ 3	32	82
Chicago	54	— 2	40	86
Eastern Pa.	44	None	33	65
Youngstown	56	+ 1	45	73
Wheeling	86	None	54	91
Cleveland	80	None	41	78
Buffalo	60.5	None	49	86
Birmingham	75	None	56	91
New England	70	None	50	70
Cincinnati	66	+ 3	65	89
St. Louis	63.5	+ 6.5	45	77
Detroit	90	+ 8	67	95
Average	64	+ .5	44.5	83

PRODUCTION

■ STEELWORKS operations last week advanced a half point to 64 per cent, the highest level of the year. Six districts showed no change, one a decline and five gained. A year ago the rate was 44.5 per cent; two years ago 83 per cent.

Youngstown, O.—Operations this week rose to 57 per cent, with an average of 56, up 1 point.

Detroit—Up 8 points to 90 per cent with lighting of two open hearths. One interest has all its 16 furnaces in production. Ford Motor Co. will light its three remaining furnaces this week, giving the district 100 per cent operation for the first time in several years.

St. Louis—Addition of three open hearths and loss of one gave a net advance of 6.5 points to 63.5 per cent, the highest this year.

Birmingham, Ala.—Unchanged at 75 per cent for the third week.

Cincinnati—Advanced 3 points to 66 per cent.

Central eastern seaboard—Steady at 44 per cent with no indication of material change.

Cleveland—Continues at 80 per cent with no interruption from the holiday this week.

Pittsburgh—Gain of 3 points to 59 per cent with indications of a further rise this week.

Wheeling—Holds at 86 per cent for the third week; slight curtailment this week is probable.

Chicago—Settled 2 points more, to 54 per cent despite increased schedules at two small plants.

New England—Remains at 70 per cent for the fourth week. A slight decline is probable this week.

Buffalo—At 60.5 per cent steel production is at the same level as the preceding week.

40% of Acme Employes Win Service Awards

■ Acme Steel Co. recently presented awards for ten years' or more service to 952 employes of its Chicago plants. They represent 40 per cent of the firm's total employment.

Of its present 2300 workers, 20 have been with Acme for 25 years or more; 49 for 20 years; 274 for 15 years; and 609 for at least 10 years.

In awarding watches and emblems during meetings held at two plants, President R. H. Norton, himself associated with the company for 35 years, attributed Acme's enviable financial record to the exceptional co-operation maintained between its employes and management. Firm has made a profit every year since its founding in 1879, has never omitted a dividend on common stock.

First Half Pig Iron Output Up 58.3 Per Cent

■ PIG IRON production in first half, 1939, was 58.3 per cent greater than in the corresponding period of 1938. Ferroalloy output was 5.7 per cent higher. Pig iron total was 12,313,366 gross tons, compared with 7,778,964 in first half last year.

Pennsylvania continued in first place with 3,226,688 tons, Ohio again second with 2,808,608 tons. Illinois produced 1,077,098 tons and Alabama 1,230,568 tons.

Iron for maker's use increased 72.3 per cent, from 6,279,907 tons to 10,820,018 tons; that made for sale was 0.44 per cent less than in first half, 1938.

Of the 343,576 tons of ferroalloys produced in first half this year 118,403 tons, 34.5 per cent, was made in electric furnaces. Total ferroalloys were 5.7 per cent greater than 325,057 tons made in first half, 1938. Accompanying tables were compiled by the American Iron and Steel institute.

HALF-YEARLY PRODUCTION OF PIG IRON AND FERRO-ALLOYS BY STATES

States	Blast furnaces (a)				Production		
	In blast Dec. 31, 1938	June 30, 1939					
		In	Out	Total	First 6 months 1938	Second 6 months 1938	First 6 months 1939
PIG IRON:							
Mass.	0	1	0	1			819,295
New York	8	8	8	16	572,599	730,618	
Penna.	25	29	43	72	2,122,809	2,713,160	3,226,688
Maryland	5	6	0	6			
West Va.	1	3	0	3	765,555	1,047,797	1,148,924
Kentucky	1	2	0	2			
Tennessee	0	1	0	1			
Alabama	15	13	6	19	870,203	1,153,065	1,230,568
Ohio	27	26	20	46	1,601,474	2,609,040	2,808,608
Illinois	9	8	15	23	708,731	947,860	1,077,098
Indiana	8	9	10	19	964,028	1,383,287	1,712,517
Michigan	5	5	3	8			
Minnesota	1	1	1	2			
Iowa	0	0	0	0			
Missouri	0	0	1	1	173,565	182,279	289,668
Colorado	1	1	2	3			
Utah	1	1	0	1			
Total	107	114	109	223	7,778,964	10,767,106	12,313,366
FERRO-ALLOYS:							
New York	1	0	1	1	117,987	100,701	126,251
Penna.	4	3	3	6			
Virginia	1	1	0	1			
Tennessee	0	0	2	2			
Alabama	1	1	0	1	78,701	69,549	98,922
Ohio	2	2	0	2			
Colorado	0	0	0	0			
Blast furnaces	9	7	6	13	196,688	170,250	225,173
Electric furnaces	....	....	....	....	128,369	119,484	118,403
Total	9	7	6	13	325,057	289,734	343,576
Grand total	116	121	115	236	8,104,021	11,056,840	12,656,942

(a) Completed and rebuilding pig iron furnaces.

HALF-YEARLY PRODUCTION OF PIG IRON BY GRADES AND FERRO-ALLOYS BY KINDS

BASIC PIG IRON

States	First 6 months 1938	Second 6 months 1938	First 6 months 1939
New York	312,450	536,317	535,577
Pennsylvania	1,551,611	2,059,620	2,406,750
Maryland, West Virginia, Ky., Ala.	1,152,985	1,562,606	1,805,354
Ohio	875,588	1,557,320	1,848,354
Indiana, Illinois	997,350	1,557,012	1,894,874
Michigan, Minnesota, Colorado, Utah	272,039	453,181	682,548
Total	5,162,023	7,726,056	9,173,457

BESSEMER AND LOW-PHOSPHORUS PIG IRON

Pennsylvania	487,761	557,903	750,467
New York, Md., West Va., Ala.	145,576	229,098	213,561
Ohio	534,173	732,919	716,011
Indiana, Illinois	156,017	210,255	223,035
Total	1,323,527	1,730,175	1,903,074

FOUNDRY PIG IRON

Massachusetts, New York, Penna.	167,625	156,569	194,012
Maryland, Ky., Tenn., Ala.	361,867	476,609	410,009
Ohio	71,627	79,621	70,307
Indiana, Ill., Mich., Col., Utah	147,117	109,547	79,342
Total	748,236	822,346	753,670

MALLEABLE PIG IRON

Massachusetts, New York, Penna.	138,738	61,571	89,680
Ohio	117,714	232,624	167,769
Indiana, Illinois, Michigan	270,947	180,841	196,580
Total	527,399	475,036	454,029

FERRO-ALLOYS BY KINDS

Ferro-manganese and spiegeleisen	154,938	135,852	147,122
Ferro-silicon	150,704	131,817	174,579
Other ferro-alloys	19,415	22,065	21,875
Total	325,057	289,734	343,576

PRODUCTION OF PIG IRON AND FERRO-ALLOYS IN THE FIRST 6 MONTHS OF 1939

(For Sale and for Maker's Use)

	For sale	For maker's use	Total
PIG IRON:			
Basic	218,835	8,954,622	9,173,457
Bessemer and low-phosphorus	110,800	1,792,274	1,903,074
Foundry	724,715	28,955	753,670
Malleable	423,740	30,289	454,029
Forge or mill	1,006	....	1,006
White and mottled, direct castings, etc.	14,252	13,878	28,130
Total	1,493,348	10,820,018	12,313,366
FERRO-ALLOYS:			
Ferro-manganese and spiegeleisen	67,457	79,665	147,122
Ferro-silicon	173,117	1,462	174,579
Other ferro-alloys	21,875	....	21,875
Total	262,449	81,127	343,576
Grand total	1,755,797	10,901,145	12,656,942

Engineering Congress Canceled as War Keeps Foreign Delegates Home

NEW YORK

■ EUROPE'S political tension has forced cancellation of the British-American Engineering congress scheduled here for Sept. 4-8, since the 250 British delegates will be unable to attend.

With more than 3000 expected, the congress had been sponsored by the American Society of Mechanical Engineers and the American Society of Civil Engineers. Plans were for their fall meetings to be held jointly with groups from the Institute of Mechanical Engineers and Institute of Civil Engineers, both of England, and the Engineering Institute of Canada. Both American societies have now called off their fall meetings.

This is the third projected international conference of engineering and steel organizations to be canceled in the United States within little more than two years due to unsettlement abroad. Last joint meeting in this country of any of the British and American societies to have participated in the congress was held at St. Louis during the 1904 World's fair.

Despite fate of the congress, papers prepared for presentation at its sessions on marine, railroad, highway and air transportation have been released.

"There is need for extensive experimentation to make steam power more suitable for high-speed, lightweight trains," declares C. T. Ripley, chief engineer of technical board, Wrought Steel Wheel Industry, Chicago, and chairman of ASME's railroad division, in a paper discussing the design and construction of passenger cars and locomotives.

Stainless for Streamliners

Several of the earliest high-speed trains were built of aluminum alloys, but in recent years most have been of stainless steel or low-alloy high-tensile steels, Mr. Ripley points out. Principal advantages of stainless steel, he says, are lower weight due to higher physical qualities, improved welding processes, great corrosion resistance, lower original and maintenance costs resulting from its avoiding the need for paint protection.

"Advocates of low-alloy high-tensile steel claim they secure equally low weights at less cost and their steels have from two to four times the corrosion resistance of ordinary carbon steel. It is not possible to make accurate weight comparisons since no identical cars have been built of the different types of steel and aluminum. However, general comparisons indicate weight advantage of at least 5 per cent for stainless steel and aluminum.

"It is too early to fully evaluate the various types of lightweight car construction, but it appears a weight of about 100,000 pounds for an 80-foot coach is entirely safe and practicable. Maintenance costs over a long period and performance in accidents will provide the ultimate answer."

The streamlined train has been definitely successful and should increase in number, Mr. Ripley asserts. He predicts steam locomotives of radical new design will be built to compete with the diesel-electric units now predominating in high-speed service.

W. A. Stanier, mechanical and electrical engineer, London, states in his paper on lightweight rolling stock that welding and high-tensile steel have been used increasingly in England during the past seven years to reduce weight without sacrificing strength. This has led to the production of an all-steel coach weighing about 500 pounds per passenger.

While the wheel and axle assembly has been slow to yield material weight savings, the elimination of the solid axle and adoption of independently sprung wheels present a line of attack. Brake gear as such may be practically eliminated, he believes, by building cylinders and rigging integral with the body frame structure. Possibility of complete departure from conventional design of car bodies cannot be ignored, Mr. Stanier says, with the body and underframe already merging and suggesting some form of tube as the next development.

Problems in design and operation of merchant vessels are outlined in a paper by Robert C. Lee, executive vice president, Moore-McCormack Lines Inc., New York. Mechanical engineering problems are discussed by Sterry B. Freeman, chief superintendent engineer, Alfred Holt & Co., Liverpool, England.

Sees Flying Boat Development

Technical improvement of airplanes and airline operations have made it possible for mileage flown by scheduled carriers in the United States to rise from 2,000,000 in 1926 to an estimated 90,000,000 for 1939, according to the paper of Edmund T. Allen, aerodynamics and flight research director for Boeing Aircraft Co., Seattle.

Flying boats will see greater use because of their facility in making landings and takeoffs, forecasts A. Gouge, general manager, Short Bros. Ltd., Rochester, England. He outlines designs for several transatlantic craft.

"Problems of the Highway User in the United States" is the subject of a paper by Frederick C. Horner, assistant to chairman, General Motors Corp., New York; and "Motor Transport" the subject of a paper by E. C. Ottaway, technical officer, London Passenger board, London.

Mr. Horner analyzes such elements as cost of construction, types of roads, taxes, and competition between transportation systems, while Mr. Ottaway described Great Britain's development of the motor vehicle, deals with the influences encouraging or restricting the engineer in his quest for improvement.

Plan To Confer All Scheduled Honors

■ Honors to have been formally conferred at the congress will be presented in some other manner. These include honorary memberships in the American Society of Mechanical Engineers for Henry Vaughan, president, Canadian Foreign Investment Corp., Montreal; and Edmund Bruce Ball, president, Institution of Mechanical Engineers, London, and managing director, Glenfield & Kennedy Ltd., Kilmarnock, Scotland.

American Society of Civil Engineers will confer honorary memberships on J. M. R. Fairbairn, past president, Engineering Institute of Canada; and W. J. E. Binnie, president, Institution of Civil Engineers, London. Institution of Mechanical Engineers will confer honorary life membership on Alexander G. Christie, ASME president.

Henry Ford was to have received in person at the congress the James Watt international medal which the Institution of Mechanical Engineers conferred last June on his proxy, Ambassador Joseph P. Kennedy. Award is in recognition of achievement as an inventor and industrial administrator.

■ Steel, iron and their products comprise the bulk of the $100,000,000 annual purchases by the Westinghouse Electric & Mfg. Co. Quarterly report to stockholders reveals these purchases are made in all 48 states, Alaska and 20 foreign countries. Copper, insulating materials, carbon brushes, and clay for porcelain products are also bought in immense quantities. Smallest purchase last year, in quantity, was ten-thousandths of a gram of radium, used in examining welds.

MEN OF INDUSTRY

■ AMBROSE N. DIEHL has retired as president, Columbia Steel Co., San Francisco, subsidiary of United States Steel Corp., due to ill health. Mr. Diehl, who has headed the steel company since 1932, closes an active career of 40 years' service to the steel industry. Beginning in 1899 Mr. Diehl joined Carnegie Steel Co. as a chemist in the laboratory of the Duquesne works. Rising through the various operations, he became assistant general superintendent, Duquesne works; operating vice president in charge of the Pittsburgh district of Carnegie; in 1930 was made vice president of the Steel corporation, and in 1932 was transferred to the Pacific coast.

William A. Ross, successor to Mr. Diehl, has been associated with the steel industry since 1895, beginning as an office boy with the old Washburn Mcen Mfg. Co. In 1899 when that firm was acquired by American Steel & Wire Co., Mr. Ross served the latter as bill clerk and cashier. In 1911 when the West coast holding of American Steel & Wire became the Pacific coast department of United States Steel Products Co., a subsidiary of the Steel corporation, Mr. Ross was appointed assistant treasurer and then assistant to the vice president of the products company. Following consolidation of the Pacific coast department of the products company with the Columbia Steel Corp., which was acquired in 1930, Mr. Ross became vice president and treasurer, and in 1932 was appointed vice president and general manager of sales, in which capacity he served until his election to the presidency.

♦

C. Donald Dallas, president, Revere Copper & Brass Inc., New York, recently returned rom a European business trip.

♦

Homer G. McClintock has been named vice president, Glenn R. McClintock & Co., Pittsburgh, producer of refractories. He will be in charge of the specialties division.

♦

Joseph Jandasek has been named research engineer, Hydraulic Brake Co., Detroit. He formerly was with the marine division of Bendix Aviation Corp., Brooklyn, N. Y.

♦

Ray Fussel, until recently engaged in sales promotion activities in New York for the Nash Motors division of Nash-Kelvinator Corp., Detroit, has been appointed merchandising manager.

♦

Fred W. Cederleaf has been made factory manager, Dodge Mfg. Co., Mishawaka, Ind., producer of industrial transmission equipment. He formerly was general manager, Diesel Equipment Corp., Chicago.

♦

E. J. Lowry, formerly of Hickman, Williams & Co., has returned from Russia, where he served eight years as chief metallurgist of heavy industries, and a year in France, England, Czechoslovakia, Austria and other European countries in the capacity of consultant in the iron and steel industries. Mr. Lowry is now associated with the Woonsocket Color & Chemical Co., Woonsocket, R. I.

Ambrose N. Diehl

♦

Henry A. Roemer, Pittsburgh, has been re-elected chairman, and James M. Hill, re-elected president, Empire Sheet & Tin Plate Co., Mansfield, O. Other officers have also been re-elected.

♦

T. W. Allsworth has joined Bridgeport Brass Co., Bridgeport, Conn., as assistant works manager, in charge of engineering equipment. He formerly was mechanical engineer, American Rolling Mill Co., Middletown, O.

♦

George W. Sweeny has been appointed assistant to president in charge of finance, H. C. Frick Coke Co., Pittsburgh. Mr. Sweeny, for many years secretary-treasurer, United States Fuel Co., Chicago, and recently assistant secretary of the Frick companies, has been associated with United States Steel Corp. subsidiaries since 1908. George M. Thursby, formerly casualty manager, succeeds Mr. Sweeny as assistant secretary, and E. W. Ruch succeeds Mr. Thursby.

♦

J. A. Sharkey has been appointed general manager of the new General Rivet division, Milford Rivet Co., Miford, Conn. The division, formerly the General Rivet Co. of Cleveland, has been moved to Elyria, O.

♦

John S. Maloney, previously consulting engineer and designer of air conditioning and fuel dispensing equipment, Gilbert & Barker Mfg. Co., has been appointed research and project engineer, Chandler-Evans Corp., Meriden, Conn.

♦

F. E. Downing, of Duluth, has been named chief mining engineer for the Minnesota tax department. He formerly was general superintendent, Shenango Furnace Co. on the Mesabi range, and at one time was with the engineering department of Cleveland-Cliffs Iron Co. in Minnesota.

♦

Leon W. Ryder has been appointed general sales manager, Barlow & Seelig Mfg. Co., Ripon, Wis., succeeding V. F. Hannon, resigned. Associated with the company since 1928, Mr. Ryder formerly was divisional sales manager for Indiana, Kentucky and Tennessee.

♦

H. E. Manville Sr. has retired as chairman of the board, Johns-Manville Corp., New York. The post will remain vacant and Lewis H. Brown, president, will continue as chief executive officer. George Whitney, director, also retired, and Henry C. Alexander was elected a new director.

♦

H. V. Huleguard has been appointed general manager, Whitcomb Locomotive Co., Rochelle, Ill., subsidiary of Baldwin Locomotive Works, Philadelphia. Mr. Huleguard has been sales manager, diesel locomotive division of Baldwin the past three years, previous to which he was general sales manager of Whitcomb. Sales and engineering activities of Whitcomb, heretofore concentrated at Philadelphia, have been transferred to Rochelle.

♦

Manly E. Lord has been appointed manager, Fort Wayne, Ind., works, General Electric Co. He succeeds Neil Currie Jr., who has become assistant to W. R. Burrows, vice president in charge of manufacturing, at Schenectady, N. Y. Mr. Lord has been associated with General Electric since 1908. In 1935 he was

named co-ordinator of all refrigerator manufacture, and on July 31 this year was assigned to cost reduction work in all manufacturing divisions of the company. Mr. Currie also started his service with the company in 1908. In 1911 he became assistant engineer, power motor engineering department; in 1920, engineer; five years later managing engineer; in 1929, manager, Philadelphia works, and seven years later was appointed manager, Fort Wayne works.

♦

Charles L. Huston Jr. has resigned as assistant staff supervisor of employment, American Rolling Mill Co., Middletown, O., to join Lukens Steel Co., Coatesville, Pa., as director of personnel. He will be in charge of personnel activities of Lukens and its divisions, By-Products Steel Corp. and Lukenweld Inc. A graduate of Princeton university

Charles L. Huston Jr.

in 1928, Mr. Huston spent the following year on special studies in metallurgy at Massachusetts institute of Technology. In July, 1929, he joined American Rolling Mill as metallurgical assistant, spending five years in the metallurgical and other operating departments, followed by five years on the Armco personal relations staff in public relations, employment and training work.

DIED:

■ THEODORE W. BEADLE, 60, secretary, Illinois Steel Bridge Co., Jacksonville, Ill., recently.

♦

Charles Barndt, 63, vice president in charge of operations, Aviation Mfg. Co., Williamsport, Pa., in Cleveland, Aug. 27. He was formerly vice president and general manager, Hamilton Metalplane Co., Milwaukee, prior to its affiliation with United Aircraft & Transport Co., and at one time was president, Racine Mfg. Co., Racine, Wis.

♦

Ezekiel Van Noorden, founder of E. Van Noorden Co., Boston, sheet metal fabricator, in Florida recently.

♦

Henry Hollander, president and treasurer, Hollander Bros. Co., Bridgeport, Conn., in that city, Aug. 15.

♦

Harry Carver, 67, retired vice president, American Can Co., New York, at his home in Gloucester, Va., Aug. 24.

♦

LaRue Gross, 56, superintendent of labor and transportation, Sharon Steel Corp., at its Lowellville, O., works, Aug. 26 in Youngstown, O.

♦

Edward Werner, 65, who, until his retirement about five years ago, operated the Superior Electroplating Co., Milwaukee, in Milwaukee, recently.

♦

John Miller Jr., 67, general superintendent, Beloit, Wis., plant of Charles H. Besly & Co., Chicago, in Chicago, Aug. 22. He had been associated with the Besly company 50 years.

♦

John R. Houston, 53, the past three years chemist, Carnegie-Illinois Steel Co., Chicago, in that city, recently. At one time he was chemist for Harnischfeger Corp., Milwaukee.

♦

Andrew E. Meneely, 54, president and secretary, Meneely Bell Foundry, Watervliet, N. Y., in Cambridge, Mass., recently. He began his business career in 1908 in the foundry established by his family over 100 years ago.

♦

Otto Fischer, 52, salesman for the Lorain products division, Carnegie-Illinois Steel Corp., Aug. 27. He had been associated with the United States Steel Corp. 33 years, and was sales agent for Lorain Steel Co. before it became part of Carnegie-Illinois several years ago.

♦

William H. Mussey, 65, engineer of research for the Pullman-Standard Car & Mfg. Co., recently in Chicago. He obtained his early engineering experience with Baldwin Locomotive Co. In 1921 he was named chief engineer, Pullman-Standard, being named engineer of research in 1935.

Activities of Steel Users, Makers

■ AMSLER-MORTON CO., Pittsburgh, has established a department devoted exclusively to the application of pulverized coal to metallurgical furnaces. This new department, prepared to design, engineer and supervise installation of complete pulverized coal units for furnaces of all types, will be under the direction of C. F. Herington.

♦

Globe Stainless Tube Co., Milwaukee, has appointed the Metal Goods Corp., St. Louis, distributor for its stainless steel tubing.

♦

Bucyrus-Erie Co., South Milwaukee, Wis., has moved its southern district office from Birmingham, Ala., to 1508 William-Oliver building, Atlanta, Ga.

♦

Allis-Chalmers Mfg. Co., Milwaukee, has booked an order from Weirton Steel Co., Weirton, W. Va., for a 10,000-kilowatt 3600 revolutions per minute topping steam turbine and generating unit.

♦

Meehanite Metal Corp., Pittsburgh, has granted Meehanite manufacturing licenses to the Vancouver Engineering Works Ltd., Vancouver, B. C., and to the Washington Machinery & Supply Co., Spokane, Wash.

♦

Franklin Engine & Mfg. Co., Franklin, Pa., has been incorporated with capital of $200,000 to succeed the Franklin Valveless Engine Co. The new company will take over the Franklin Valveless plant and equipment.

♦

Service on all UCC combustible gas indicators, manufactured by the Linde Air Products Co., New York, now in use will hereafter be maintained by the Davis Emergency Equipment Co., 55 Van Dam street, New York.

♦

Installation of new and modern machinery and the institution of new factory methods, part of a broad expansion and plant modernization program inaugurated two years ago, has made possible the building of 1674 additional different parts in its own shops during the past year, according to announcement by W. A. Olen, president and general manager, Four Wheel Drive Auto Co., Clintonville, Wis. The company is now installing machinery for building complete cabs for its entire line of trucks.

Windows of WASHINGTON

By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ IMMINENCE of general warfare in Europe spotlights the newly-created war resources board meeting here to whip into working order America's plan for industrial mobilization.

Charged with the task of swiftly gearing the nation's productive capacity to face any emergency, the group of industrial leaders, headed by Edward R. Stettinius Jr., board chairman of United States Steel Corp., in wartime would become czars of industry. Board was appointed by the President, is responsible solely to him.

Guided by Assistant Secretary of War Louis Johnson, the board is expected to extensively revise mobilization blueprints which war department officials have been drafting during the past 18 years. While details of sessions are being closely guarded, it is known various experts of the war, navy, commerce and labor departments have been called into conference.

Studying Nation's Course

Preliminary report already has been submitted to President Roosevelt, and detailed plans are expected to follow within a few days.

Board is mapping three lines of national action. These will deal with the situation if there is no war, if a general European war breaks out, if the United States should become involved. Principal aim in the latter event will be to avoid industrial demoralization such as followed our entering the World war. Wartime problems the board seeks to solve:

1—Prevention of inflation, multiplying the war's cost and accentuating severity of succeeding depression. Some form of price-fixing is thought to be under discussion in this regard.

2—Minimizing of labor competition and migration. Removal of hour-restricting legislation would be virtually certain. Women and children probably would be put to work, and although it is not likely idle men would be actually drafted for jobs, they might be required to find some necessary employment or join the army.

3—Curbing of out-of-line increases in wages and the cost of living.

4—Restraint of profiteering through taxation. It is considered probable the board would avoid any confiscation of capital, however, and would endeavor to encourage industry.

PLANS MAPPED TO SPEED SHIPBUILDING FOR DEFENSE

Shipyard facilities have just been surveyed by officials of the maritime commission and navy department in preparation for any necessary acceleration of merchant marine and naval construction under national defense plans.

Specifications for vessels which would be needed to supplement the nation's merchant and fighting fleets have been drawn up and can be turned over to shipbuilders at a moment's notice. Although a large volume of tonnage is now underway, it is reported all yards can boost their output without difficulty.

Maritime commission on July 1 had underway a building program involving 66 merchant ships aggregating 601,894 gross tons. Since then awards have been made for 17 additional craft.

Exact volume of naval construction now in progress is uncertain, but on June 1 the navy had under construction 8 battleships, 2 aircraft carriers, 6 light cruisers, 21 submarines, 43 destroyers, 2 destroyer tenders, 2 mine sweepers, 1 submarine tender, 3 fleet tugs, 6 seaplane tenders and 1 mine layer.

In event of war naval needs will be given priority. Old-line shipyards will be assigned to construction of fighting vessels, while the new and smaller yards will build cargo ships and tankers. Boats built under the maritime commission's merchant marine rehabilitation program have been designed so as to be convertible to wartime use. Both cargo vessels and tankers thus constructed could be used as supply convoys for the battle fleets.

America's merchant marine today "is not comparable" with its feeble merchant fleet of 1914, Admiral Emory S. Land, chairman of the maritime commission, declared last week. We now have available 300 vessels, three times those of 1914. In that year, he asserts, the nation had few ships capable of carrying our trade, and no others could be had without payment of impossible premiums. Between 1914 and 1920 the merchant marine was built up at an unprecedented rate. Most of this emergency-borne construction has since become antiquated, and the commission's present program looks to replacement.

URGE FEDERAL AGENCY FOR RESOURCE CONSERVATION

National resources committee in reporting to congress last week urged creation of a federal agency to conserve the nation's power and fuel resources for defense and recovery. Headed by Secretary of Interior Harold Ickes, the committee includes the secretaries of war, commerce, labor and agriculture.

Should regulation of utilities fail to solve their problems, committee warned, "there may emerge insistent demands for public ownership and control. It is difficult to envisage a national coal, petroleum or water-power policy without . . . a national policy directed toward all."

After months of technical research committee has determined three ways of effecting resources conservation:

1—Achieve greater efficiency in production of fuel.

2—Promote greater economy in the use of fuels.

3—Place a larger share of the

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country's energy burden upon lower-grade fuels and waterpower.

To attain these objectives the group suggested:

Formation of a new federal oil conservation board to safeguard the national interest in the oil and gas industry by regulating production and trade in oil and gas to avoid waste.

Some form of federal regulation of bituminous coal, since "the problems of that industry are too large for any one state to solve, and its intense interstate competition makes the industry's ills a matter of national concern and federal responsibility."

Launching of an active public policy of multiple-purpose development of all water resources, in view of the pressing problems of flood control, public supply, stream pollution, irrigation and navigation. Such water development, the committee added, might conserve fuel, strengthen national economy and bolster the defense program "through assuring an ample supply of electric energy in time of war."

To correlate these related programs and permit continuous planning in the future, the committee asked an advisory planning agency be established for all energy resources of the United States.

LEGATION RECEIVING BIDS ON RAIL EQUIPMENT FOR IRAN

American companies interested in bidding on railway equipment to be purchased by the Iranian government may submit bids to the Iranian imperial legation here, on or about Sept. 6, according to transportation division of the commerce department. Tenders should be accompanied with the annotation that the letter contains a bid to be opened in Teheran only. Equipment needed includes locomotives, shunting engines, freight cars and special coaches.

Circular has been released announcing changes in conditions of adjudications for the purchases. All prices quoted must be c.i.f. Bandar Shahpur. This is to include war risk insurance. The successful bidder or bidders are responsible for transporting equipment to Iran and must guarantee the rolling stock will be satisfactorily assembled.

NEW ARGENTINE TRADE PACT SEEN BY STATE DEPARTMENT

State department officials believe imminent a successful conclusion to their long-continued efforts to effect a new trade pact with Argentina.

If such agreement is consummated it will be the first commercial arrangement between the United States and Argentina since 1855, when the present "treaty of friendship, commerce and navigation" became effective. This treaty, it is understood, is to a large extent obsolete, particularly in its handling of commerce.

Next to Canada, Argentina was our most important market in this hemisphere last year. It is a market of great potentialities in view of the country's virtually unlimited capacity for economic development.

Said Acting Secretary of State Sumner Welles last week: "Our trade with Argentina has suffered in recent years for lack of a trading agreement. The trade of certain European countries with Argentina has been developing at our expense under the influence of their commercial pacts with that nation. Placing of American commerce in Argentina on a footing of full equality with that of our competitors was a subject which was fully explored in preliminary discussions. This agreement should enable us to maintain our competitive position in a market of great present and prospective importance."

ARMS PRODUCTION LAGGING, SAYS ARMY STAFF CHIEF

Despite record appropriations for better defense weapons, our production of arms is lagging, according to Gen. George C. Marshall, army chief of staff. Now in use by the United States army is a rifle "nearly 35 years old." He compares its antiquity with that of a pioneer automobile.

Gen. Marshall points out the inevitable gap between appropriation of funds and actual production. However, output of improved types of weapons is being pushed, and should soon attain the necessary volume.

HOUSE COMMITTEE TO LAY PLANS FOR NLRB PROBE

Special house committee appointed by the speaker at the close of the last session of congress to investigate the national labor relations board, will hold an organization meeting Sept. 7. Chairman is Representative Smith, Virginia.

Senator Thomas, Utah, heading a subcommittee of the senate committee on labor to look into the same board, said last week he believes congress probably will not consider any amendments to the Wagner act until the house committee has made its report. He asserted there is only remote possibility that either the labor act or the wage-hour law will be materially revised during the coming session of congress.

Thomas stated he expects reports on the labor act from both Secretary of Labor Perkins and Secretary of Commerce Hopkins before his subcommittee resumes its hearings in January. The labor secretary urges that NLRB, now an independent agency, be brought under control of her department so there can be greater co-operation with the labor conciliation service of the labor department. It is believed, however, most members of the senate subcommittee favor continuation of the board as an independent agency.

Removal of some of the law's restraints on employers is likely to be pushed by Hopkins. It is said his department is receiving complaints from many small business men throughout the country. Chief complaint is reported to be that employers' right of free speech has been curtailed by restrictions against advising employes on labor relations.

MORE INDUSTRIAL MACHINERY GOING TO VENEZUELA

Reflecting steady industrial progress being made in Venezuela, our exports of industrial machinery to that country last year rose to $11,440,493 from $9,582,375 in 1937, reports the machinery division of the commerce department. Venezuela ranked fifth among export markets for American industrial machinery during 1938.

By far our best customer for petroleum well and refining machinery, Venezuela took $6,892,861 worth of this equipment in 1938. Well-drilling equipment is her principal need. Substantial gains were shown in purchases of construction and pumping equipment, power-generating and metalworking machinery.

MOTOR TRUCK FREIGHT DOWN 7.2 PER CENT IN JULY

Although remaining well ahead of last year, movement of freight by motor truck during July declined 7.2 per cent from June, according to the American Trucking Associations Inc.'s monthly survey of loadings.

Reports received from 214 carriers in 38 states show aggregate loadings of 766,497 tons in July, as compared with 826,297 tons in June and 629,695 tons in July, 1938.

Tonnage for July this year represents a gain of 21.7 per cent over that month of 1938 and a 13.5 per cent increase over the 1936 monthly average. ATA's truck loadings index figure for July stood at 113.56 as against 118.84 for June, and 90.68 for July, 1938. In computing the index the average tonnage transported monthly during 1936 is taken as 100.

All classes of commodities reported for July decreased in volume as compared with June, with the exception of petroleum products, which recorded a rise of 2.2 per cent over the previous month and 24.2 per cent over July, 1938.

AVIATION

CIVIL AIRPLANE OUTPUT SHOWING STEADY RISE

■ DESPITE the powerful emphasis currently placed on military aviation, production of private and commercial aircraft is advancing steadily. Builders of these planes will show for 1939 an average gain in output of some 50 per cent over last year, it is estimated by civil aeronautics authority.

During the first six months this year 1162 civil craft were turned out for domestic use, compared with 853 for the corresponding period of 1938.

With all major airlines now in the black and their traffic rising sharply, continued substantial buying of transport ships is anticipated. In the first half domestic lines took delivery on 40 planes in the multimotored class of 25,000 pounds or more. How rapidly air passenger business is increasing is evidenced by the 56 per cent gain recorded during July over the same month the preceding year.

Unprecedented demand for civil planes is expected to develop when the CAA program for pilot training is well underway. Signed by the President in June, bill setting up the program proposes to add 95,000 flyers within five years to our present 23,000. It provides $5,675,000 for training 15,000 this year, authorizes $7,000,000 annually to train an additional 20,000 during each of the next four years. Training courses will be carried on in conjunction with more than 300 colleges and universities.

Presidential proclamation will open on Sept. 11 a nationwide two-week air progress celebration. Sponsored by National Aeronautics association and supported by all government aviation agencies, celebration is intended to demonstrate aviation's vital importance to the nation. In discussing the plans, Dr. John W. Studebaker, United States commissioner of education, calls attention to youth's growing demand for aeronautical training.

Today's active market for private craft is attested by record output at the Lock Haven, Pa., plant of Piper Aircraft Corp., a leading lightplane builder. During July this firm produced 181 units, 151 per cent ahead of that month last year.

Announce Equipment Contracts

Worden-Allen Co., Milwaukee, has contracted to fabricate steel frames for portable buildings to house radio beam transmitting facilities along air routes. Company booked a $130,000 CAA order for 191 buildings varying from 8 x 12 feet to 16 x 32 feet.

Bids now are being received by the navy department on construction of two seaplane hangars at its naval air station in Alameda, Calif. Each structure is to be approximately 240 x 470 feet.

Recent navy awards for aeronautical equipment: Douglas Aircraft Co. Inc., Santa Monica, Calif., spare parts, $716,900; Wright Aeronautical Corp., Paterson, N. J., engines, $375,000; and Curtiss Propeller division of Curtiss-Wright Corp., Clifton, N. J., propeller assemblies, $275,310.

Operations soon are to be transferred from Lindenhurst, N. Y., to a plant at Clearfield, Pa., announces Airplane & Marine Direction Finder Corp., maker of airplane and other precision instruments. Capacity will be increased.

Rubber-mounted motors now are being built for lightplanes by Continental Motors Corp., Detroit. First manufacturer of light ships to install the engines is Taylor-Young Airplane Co., Alliance, O.

New technique developed by the University of Illinois for taking X-ray photos, "dot photography", is proving useful in analyzing strength factors of aircraft metals. This method has already solved one problem in the making of duralumin propellers by discovering conditions under which true "solution" of copper may take place in aluminum. Duralumin comprises 96 per cent aluminum, 4 per cent copper. "Dot photography" employs a beam of X-rays no larger than a lead pencil, the rays casting an atomic skeleton shadow on the film. When a 200 to 600-power microscope is placed over a single dot, thousands of fine lines and shadows are resolved.

"Salvage Ship" for Army Planes

■ **For salvaging damaged aircraft, army air corps developed this new type wrecking truck. Towing a trailer with 40-foot loading platform, truck has 10-ton crane with 15-foot boom, carries floodlights for night operation. Powerful drum-type winch is used to pull wrecked planes from inaccessible spots**

Union Carbide Approves Purchase of Bakelite Corp.

■ Acquisition of all assets of the Bakelite Corp., New York, by the Union Carbide & Carbon Corp., New York, has been approved by the directors of the latter concern. The co-ordination of technical knowledge, research, production methods, and distribution facilities of these two organizations is expected to result in the improvement of existing products, the development of new plastics and other chemical compounds, and the discovery of new uses for such materials.

Bakelite Corp. has been active in the manufacture and distribution of thermosetting plastics, principally of phenolic types. During recent years an increasing number of Carbide's synthetic organic chemicals have been used as raw materials in various plastics, including those made by Bakelite.

More than 25 years ago Dr. L. H. Baekeland discovered the new plastic material which he named "Bakelite". Products of this material have since become well known.

Under the agreement there will be distributed to Bakelite stockholders 187,500 shares of Carbide common stock exchanged for Bakelite's assets. Shareholders of Bakelite Corp. will be entitled to 1¼ shares of Carbide common for each share of preferred stock of Bakelite now held, while the remainder of the Carbide stock will be divided among common stockholders of Bakelite.

The agreement will become effective upon ratification by holders of each class of Bakelite stock.

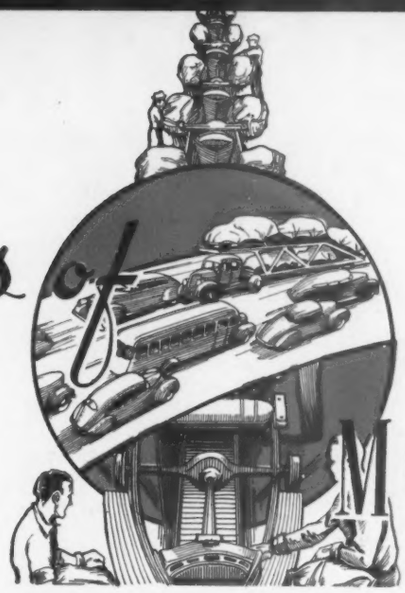
SMOOTH GOING...ON HYATTS

When at the Iron and Steel Exposition in Pittsburgh, you are invited to visit the Hyatt Exhibit—Space 74—Lower Exposition Hall.

Built for speed and endurance under precision standards, Hyatt Roller Bearings play an essential role in the smooth functioning of equipment. They absorb the uneven surges of force... they conserve power... they promote operating efficiencies. They avoid friction, wear, attention, and replacement. It is this kind of performance and economy that Hyatts add regularly to new equipment or changeovers . . . and explains why they are used year after year in ever-increasing numbers. Hyatt Bearings Division, General Motors Sales Corporation, Harrison, New Jersey; Chicago, Pittsburgh, Detroit, and San Francisco.

HYATT *Roller Bearings*

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

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DETROIT

■ AS A BAROMETER of general industrial activity, steel production has reflected widespread improvement, without the support of heavy buying for automobiles. True, there have been some instances of increased open-hearth operations in anticipation of later automotive releases, but these are confined to companies such as Great Lakes Steel Corp. here where automotive tonnage accounts for a major share of total output. Great Lakes has been operating 14 of its 16 furnaces for the past three weeks, four being lighted about Aug. 11 to build up some stock of semifinished against heavy auto commitments. The remaining two units were lighted last Monday and the plant now is in full production. However, increase in the national steelmaking rate up to the middle of August was the result of better steel buying in a host of industries other than automotive.

Lately steel buying for 1940 models has been accelerated and should provide further impetus to a rising steel rate. Observers here look for releases to be stepped up steadily throughout the current month and October, and hence are inclined to be optimistic for the fall season. One steel company here by Aug. 22 had exceeded the tonnage placed during all of July through its Detroit office. Another reports district tonnage for August about on a par with July, not quite up to the June level, but approximately double the bookings recorded for August a year ago.

Ford will not conclude the initial steel buy for 1940 models until Sept. 25. The purchase, mostly sheets, will amount to about 100,000 tons, much of which already has been placed. A second buy is anticipated shortly after Oct. 1. Briggs is expected in the market in the near term for another tonnage for Chrysler bodies. Fisher Body has been releasing tonnage on a sustained basis for preliminary assemblies and should continue through the fall weeks on an even higher level.

An important factor during September will be Chevrolet, which will not be in production on 1940 models until Oct. 1 because of lack of bodies. Formal announcement is scheduled for Oct. 14. Meanwhile, however, subassemblies are being speeded, and by the middle of last week some were up to a level of 5000 per day. Chevrolet truck models for 1940 will be ready by Sept. 15, M. E. Coyle, general manager, told newspaper men ten days ago.

Evidently the strike of tool and die makers crippled Chevrolet plans for 1940 more seriously than it did others in the General Motors line, for Buick, Olds and Pontiac are already swinging into full production on 1940 models. Of course the preliminary work on these three was scheduled in advance of Chevrolet, and their programs were considerably ahead of Chevrolet when the strike hit. It is understood the bottleneck on the 1940 Chevrolet body program has been at Ternstedt, which supplies practically all hardware.

Not much credence is given the rumor that the delay in the Chevrolet program—if it can be considered a delay—was occasioned by last-minute revisions in details made

Building 1940 Buick

■ **Manufacturing parts and subassemblies for the final assembly line occupies many manufacturing departments in Buick factories. Here a gear and axle plant employe is assembling the 1940 torque tube to the differential carrier**

after competing lines had been displayed. Volume producers like Chevrolet and Ford have to build up heavy banks of subassemblies and parts before final assemblies can be started. Assuming a bank or float of 100,000 to be required by Chevrolet, four weeks alone would be needed to manufacture this material, on the basis of 5000 per day.

Furthermore, Chevrolet probably is more interested in what Ford will do for 1940 than in what any other competitor has done, and the Ford lines for 1940 have not been disclosed as yet even to the press, although a tentative date of Sept. 29 for the first public announcement is being aimed at.

Body designs for 1940 are good news to more than one steel company. Plymouth, for example will require about 4,250,000 square feet more sheet steel than last year to build the first 250,000 cars, which figures out to an additional 3200 tons or 25 pounds per car. Similar increases will be noted for Dodge, De Soto and Chrysler lines, so that Chrysler Corp. will require an estimated 13,000 more tons of steel for bodies alone in the 1940 model year, assuming production of 1,000,000 cars.

Larger bodies require longer frames and other chassis changes which further boost steel requirements. Nor is Chrysler alone in featuring larger bodies, General Motors lines and probably Ford also emphasizing more space for passengers in their new cars. The two new body styles shown by Buick, Olds and Pontiac are about 5 inches wider than formerly, requiring a proportionately greater amount of steel for panels and outer members, as well as in sills, cross bracing and other structural pieces.

First of the 1940 Plymouth models were shown last Friday at the Michigan State fair here, and will continue on display until Sept. 10. Wheelbase is longer by 3½ inches, bodies are new, with or without running boards. Steering post gearshift is supplied on both deluxe and Roadking models. Luggage compartment is completely concealed, larger and lighted at night by inside "windows" at the rear of the two tail lamps which are moved several inches further inward and streamlined into the rear of the body. After the Michigan preview, formal introduction of the new Plymouth is planned through ads in more than 1600 newspapers, simultaneously with a complete display of the models by dealers.

■ CONSOLIDATION of manufacturing operations by the motor companies and further integration of their facilities is continuing to take its toll of outside suppliers. Latest example is that of a once-important body manufacturer in this area which for decades has supplied requirements of various producers. This company now is reported without any body business whatsoever and necessarily has had to cut back its staff of engineering, clerical and plant employes. Meanwhile the company is attempting to fill the breach with diversified products, in the manufacture of which it can use facilities formerly required for body stampings, metal finishing and assembly.

It is reported around Detroit that inability to meet prices specified by the customer, plus several instances of work sabotage resulting from difficulties with union employes were important reasons for the company relinquishing the most recent body business it had.

Assemblies of the Crosley midget car have been suspended, according to word from Cincinnati, and a complete redesign from "stem to stern" now is being contemplated. It is not disclosed how many of the original design had been assembled at Richmond, Ind., although output probably had not exceeded a few thousand. Seasoned automotive observers in this area never conceded Crosley much chance with this small car, feeling that it was over-priced, that it was weak on body design and construction.

Second week of 1940 model production by Pontiac has been completed and about 3000 assemblies shipped. A new and longer final assembly line is in operation and schedules for this month call for production of around 15,000 cars by the 15th. At recent showing of the new lines, H. J. Klingler, general manager, said the company would introduce a new "luxury" eight (with Torpedo body previously mentioned here) as well as a new low-price six on shorter wheelbase. Pontiac sales officials are looking for a 20 per cent improvement in 1940 model production and have set a goal of 175,000 cars.

Hudson has been granted a patent covering its system of "autopoise" control, a stabilizer mechanism connected directly to front wheels which employs a positive, active mechanical force to hold wheels to their course. Introduced first on 1939 models, the system is continued on 1940 jobs and consists of a spring steel leverage device with the ends angled back to form shock cushioned mechanical arms connected directly to the wheel spindles which turn with the steering. Attachment points are located so that whatever force turns the wheels from their true course—whether wind or road shock—is resisted by the mechanical arms, tending to hold the wheels to their true course wholly independent of wheel-to-road contact.

■ EUROPEAN war preparations naturally have given rise to speculation on the possible effect on overseas operations of American car manufacturers. General Motors has plants in Germany and England which, in event of war, no doubt would be commandeered by the respective governments and converted to war purposes, with the difference that in Germany the Opel plant likely would be seized arbitrarily by the Nazis with little or no recompense for the owners. This was what happened to the General Motors plant in Spain during the recent insurrection there, and it is believed that in totalitarian countries war would mean writing plants there off as a total loss. A different situation no doubt would prevail at the Vauxhall plant in England which conceivably would be commandeered for war production, but at least the owners would retain title and a measure of operating control. In informed quarters here, however, there was scant conviction hostilities would develop in Europe last week. While naturally unsettling in nature, the difficulties were regarded more as the thrusts and counterthrusts of master bluffers than as signalling actual war.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1937	1938	1939
Jan.	399,186	*226,952	*356,950
Feb.	383,900	*202,597	*317,517
March	519,022	*238,447	389,489
April	553,231	*237,929	354,263
May	540,377	*210,174	313,214
June	521,153	*189,402	324,235
July	456,909	*150,450	*218,478
7 mos.	3,373,778	*1,455,951	*2,274,146
Aug.	405,072	*96,946	.....
Sept.	175,630	89,623	.....
Oct.	337,979	*215,286	.....
Nov.	376,629	*390,405	.....
Dec.	347,349	*406,960	.....
Year	5,016,437	*2,655,171	.....

* Revised.

Estimated by *Ward's Reports*

Week ended:	1939	1938†
Aug. 5	28,250	14,771
Aug 12	24,875	13,790
Aug. 19	12,955	23,940
Aug. 26	18,365	18,700
Sept. 2	25,240	22,165

†Comparable week.

	Week Ended	
	Sept. 2	Aug. 26
General Motors	7,200	2,600
Chrysler	7,025	6,800
Ford	...	450
All others	11,015	8,515

DEPENDABILITY
PHILO
BRAND
QUALITY • SERVICE
Ohio Ferro-Alloys Corporation
Canton, Ohio

Editorial

Industry and the Neutrality Law

■ IN THE event that the threatening situation in Europe culminates in war, congress is sure to be called into an extra session to give renewed consideration to the President's proposals for revision of our existing neutrality law. For the existing law, in the event of war, would prevent us from shipping arms and ammunition to England and France, in effect allying us with the axis powers. That is a position that would not be tolerated by the American public.

The list of arms, ammunition and implements of war which would automatically be embargoed under the neutrality act in the event of war includes rifles, carbines, parts and ammunition in excess of 0.22 caliber; machine guns, automatic and unloading rifles, machine pistols, revolvers and automatic pistols using ammunition in excess of 0.22 caliber; guns, howitzers and mortars of all calibers and their parts; grenades, bombs, torpedoes, mines and depth charges; tanks, military armored vehicles and armored trains; vessels of war of all kinds; aircraft, military or civilian, engines and parts; projectors and flame throwers and a list of 21 types of gases; propellant powders and 17 types of high explosives.

Present Law Covers all War Materials And Applies to all Belligerents

There has been considerable speculation as to possible loopholes, since the law contains a clause which permits the President to issue from time to time a new embargo list of arms, ammunition and implements of war. It also contains a stipulation that such a new list must include those commodities enumerated in the President's 1936 proclamation. It would be impossible under the existing law, therefore, to issue a list which would not include all war materials and many raw materials, and which would not apply to all belligerents.

Industry is not much concerned over foreign contracts for airplanes and other products now on its books, for these contracts as a rule contain provisions that will protect the contractors against loss should they be unable, as a result of our present neutrality law, to make delivery. And industry is on record as opposed to war. As far as known, no demands for a change in our neutrality law have been voiced by industry. Such demands have come from the administration, some members of congress and from various commentators and newspaper editorial writers who have endeavored to reflect public sentiment on this subject.

Industry Fears Blanket Power as Opportunity for Further Restriction

On the other hand, industry would feel real concern if congress were to give the President what he really wants—a free rein with reference to our acts as a neutral nation. Industry fears that a bestowal of such blanket authority might get us into war, with resulting disturbance in our economic life for many years to come. It fears even more that such blanket powers in the hands of the President might be exercised in the spirit of applying further "reforms" and governmental restrictions to business.

If our existing neutrality law is to be changed in accordance with prevailing public sentiment, industry would prefer that the responsibility for directing our trade with belligerents be lodged, not individually in the President, but in a council of national defense consisting, as suggested by Walter Lippmann, of the President and half a dozen or so members of congress—including representatives of the Republican and Democratic anti-administration groups. Decisions of such a council necessarily would be tempered by compromise and the country would be protected against rash acts of extremists.

The BUSINESS TREND

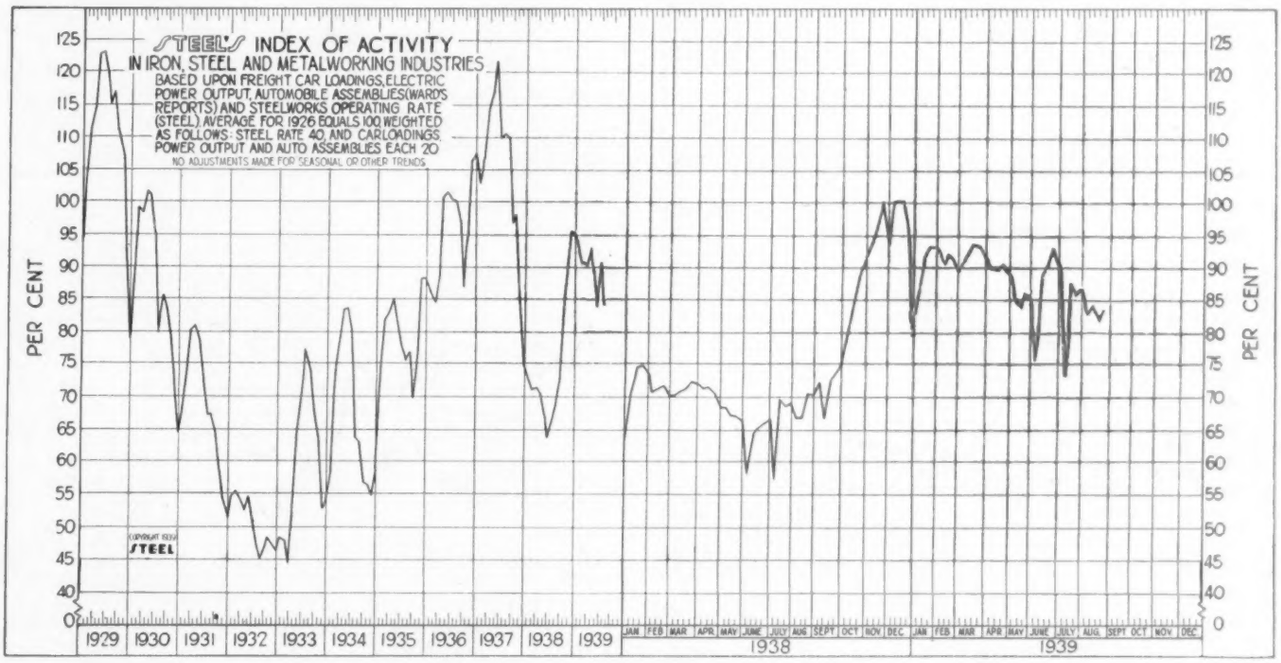
Industrial Activity Resists Adverse Foreign Influences

■ REFLECTING the moderate increase in automobile production and seasonal advance in revenue freight carloadings, STEEL's index of activity in the iron, steel and metalworking industries recorded a slight advance of 1.2 points to 83.4 in the week ended Aug. 26. The recent gain in the index restores most of the ground lost in the preceding week and compares favorably with the 70.3 level recorded by the index at this time last year.

An encouraging factor in the current outlook is that steelmaking operations are holding steady at the peak level of the year, despite the disturbing foreign influences which normally tend to temporarily disrupt domestic industrial activity. The national steel rate remained unchanged at 63.5 per cent during the week ended Aug. 26 and as the 1940 automobile production year gets underway still further gains in steelworks operations may be expected. A year ago the steel rate stood at 43.5 per cent.

The moderate increase in automobile production to 17,465 during the week ended Aug. 26, verifies earlier indications that the low point in production during the changeover period was reached during the week ended Aug. 19. This represents the first increase in automobile assemblies since the rebound in the week immediately following the Fourth of July holiday. At this time last year motor car production was slightly above the current level. However, it will be recalled that the low point in the changeover period was a week earlier.

Current indications seem to point to a continued in-


STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL). AVERAGE FOR 1926 EQUALS 100. WEIGHTED AS FOLLOWS: STEEL RATE 40, AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20.
NO ADJUSTMENTS MADE FOR SEASONAL OR OTHER TRENDS.
PER CENT
STEEL
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
1938
1939

STEEL'S index of activity gained 1.2 points to 83.4 in the week ended Aug. 26:

Week ending	1939	1938
June 10	88.2	64.4
June 17	90.9	65.2
June 24	93.0	66.0
July 1	91.0	66.5
July 8	73.4	57.1
July 15	87.8	69.9
July 22	86.0	68.7
July 29	86.8	69.0
Aug. 5	83.5	66.9
Aug. 12	83.9	66.9
Aug. 19	82.2	70.5
Aug. 26	83.4	70.3

Mo. Data	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Jan.	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
Feb.	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
March	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
April	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
May	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
June	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
July	83.7	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Aug.	....	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Sept.	....	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Oct.	....	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Nov.	....	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
Dec.	....	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

crease in automobile production for the immediate future as producers step-up assembly schedules on 1940 models. Increase in automobile output at this time may do much to balance any slowing down in general industrial activity that might result from conditions abroad.

Electric power consumption during the week ended Aug. 26 of 2,354,750,000 kilowatt-hours failed to retain the peak levels recorded in the preceding week. However, this is considered only a minor fluctuation and it is confidently predicted that new high levels will be reached during the fall months.

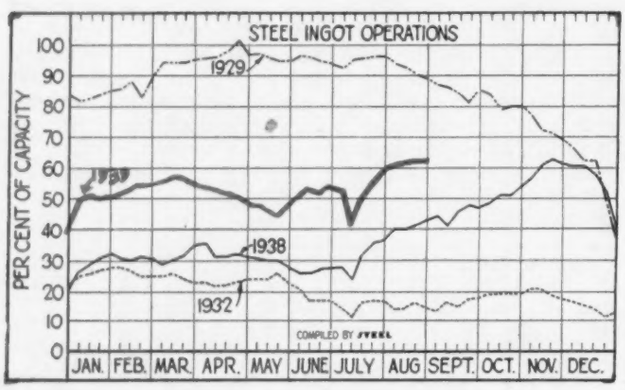
Revenue freight carloadings during the week ended Aug. 26 continued the steady upturn noted since the Fourth of July holiday week. Freight traffic in the latest week of 688,591 cars compares with 674,237 in the week ended Aug. 19 and remains well above the 620,511 freight cars loaded in the comparable week a year ago.

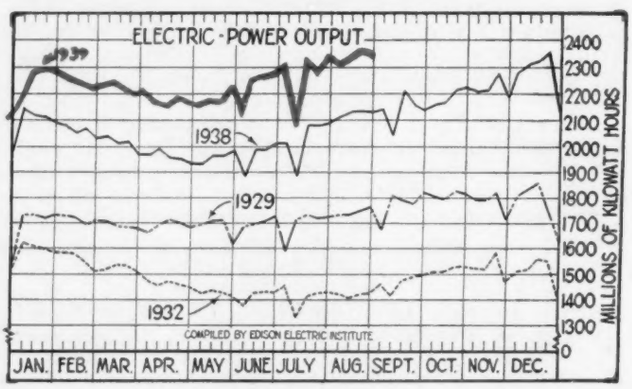
COMMERCIAL FAILURES DECLINE IN JULY

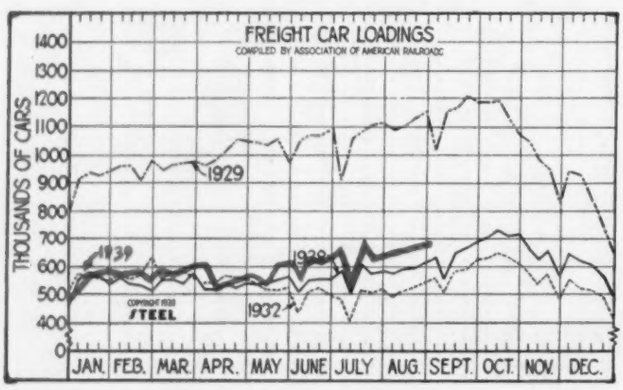
Commercial failures during July recorded a slightly more favorable comparison with a year ago than did the June total, and were the best since last February. The decline in failures in July were about the normal seasonal proportion. Insolvencies that month totaled 917 involving $14,150,000 of current liabilities, against 952 disasters with $11,609,000 liabilities during June. In July last year failures aggregated 1038 and liabilities totaled $14,761,000. All the commercial groups had substantially fewer insolvencies in July than in the same month a year ago, and three of the five divisions, the retail, construction and commercial service groups, were smaller than in the month preceding.

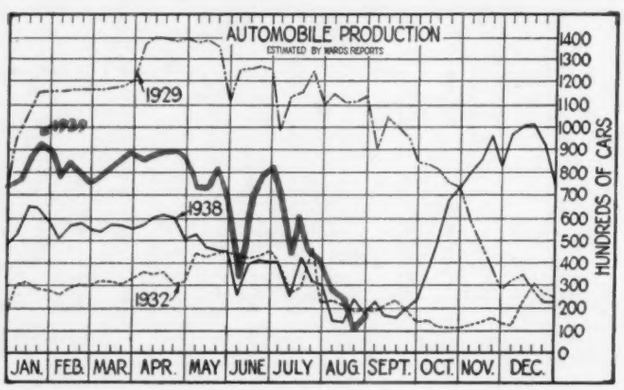
RAILROAD EARNINGS IMPROVE

Net railway operating income for the Class 1 railroads during July continued the upward tendency which got underway during May, according to the Association of American Railroads. The July net operating net income for the carriers totaled $49,011,915, compared with $38,431,251 in July, 1938, and $39,095,476 in June of this year. Return on property investment during July was at the annual rate of 2.07 per cent, against 1.62 per cent in July last year and 1.83 per cent in June, 1939. In the first seven months this year net operating income totaled $214,762,841, compared with $109,616,765 in the comparable 1938 period.

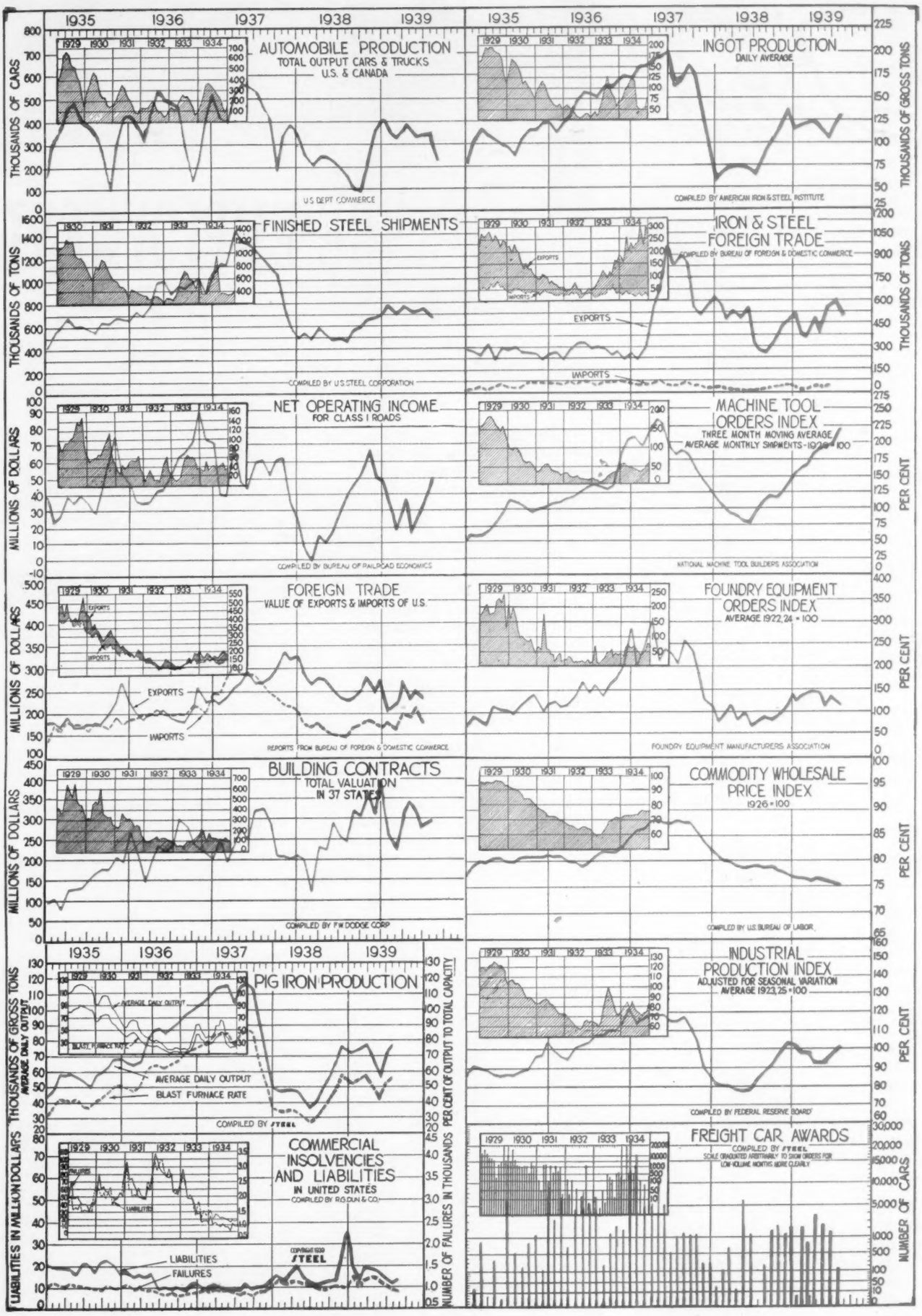








Week ending	Steelworks Operating Rate Per Cent 1939	1938	1932	1929	Electric Power Output Million KWH 1939	1938	1932	Freight Car Loadings Thousands of Cars 1929	1939	1938	1932	1929	Weekly Auto Output 1939	1938	1932	1929
May 13	47.0	30.0	24.0	97.0	2,171	1,968	1,436	1,698	555	542	517	1.048	72,375	47,415	42,587	138,541
May 20	45.5	30.0	25.5	96.0	2,170	1,968	1,435	1,704	616	546	516	1,046	80,145	46,810	43,470	139,528
May 27	48.0	28.5	23.0	95.0	2,205	1,973	1,425	1,705	628	562	521	1,061	67,740	45,120	45,121	136,032
June 3	52.0	25.5	21.0	95.0	2,114	1,879	1,381	1,615	568	503	447	972	32,445	26,980	44,116	111,372
June 10	53.5	25.5	17.0	96.5	2,257	1,992	1,435	1,690	635	554	502	1,055	65,265	40,175	43,491	125,307
June 17	52.5	27.0	17.0	96.0	2,265	1,991	1,441	1,699	638	556	518	1,069	78,305	41,790	44,121	126,125
June 24	54.5	28.0	17.0	94.0	2,285	2,019	1,440	1,723	643	559	499	1,096	81,070	40,918	45,110	125,736
July 1	54.0	28.0	14.5	93.0	2,300	2,015	1,456	1,592	666	559	480	909	70,663	40,945	40,291	98,746
July 8	42.0	24.0	12.0	95.0	2,078	1,881	1,341	1,712	559	501	416	1,065	42,784	25,375	26,560	113,586
July 15	50.5	32.0	15.5	95.5	2,234	2,084	1,415	1,727	674	602	504	1,079	61,610	42,010	29,870	115,075
July 22	56.5	36.0	16.5	96.0	2,295	2,085	1,433	1,723	657	581	502	1,101	47,420	32,070	46,375	123,512
July 29	60.0	37.0	16.5	96.0	2,342	2,094	1,440	1,725	660	589	511	1,104	40,595	30,390	22,461	110,163
Aug. 5	60.0	40.0	14.5	94.0	2,325	2,116	1,426	1,730	661	584	497	1,091	28,250	14,771	23,591	114,364
Aug. 12	62.0	40.0	14.5	93.0	2,333	2,134	1,415	1,733	661	589	512	1,100	24,875	13,790	21,162	111,939
Aug. 19	63.5	41.5	15.5	90.0	2,368	2,139	1,431	1,750	674	598	518	1,136	12,955	23,940	19,568	111,902
Aug. 26	63.5	43.5	14.5	89.0	2,355	2,134	1,436	1,762	689	621	538	1,160	18,365	18,700	19,896	113,316


AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS U.S. & CANADA
U.S. DEPT COMMERCE
INGOT PRODUCTION
DAILY AVERAGE
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
FINISHED STEEL SHIPMENTS
COMPILED BY U.S. STEEL CORPORATION
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
NET OPERATING INCOME
FOR CLASS I ROADS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS-1929 = 100
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922,24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACTS
TOTAL VALUATION IN 37 STATES
COMPILED BY F.W. DODGE CORP
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
COMPILED BY STEEL
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923,25 = 100
COMPILED BY FEDERAL RESERVE BOARD
COMMERCIAL INSOLVENCIES AND LIABILITIES
IN UNITED STATES
COMPILED BY R.G. DUN & CO.
LIABILITIES
FAILURES
COPYRIGHT 1939 STEEL
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW-VOLUME MONTHS MORE CLEARLY
THOUSANDS OF CARS
THOUSANDS OF TONS
MILLIONS OF DOLLARS
THOUSANDS OF GROSS TONS
PER CENT
NUMBER OF CARS
LIABILITIES IN MILLION DOLLARS
NUMBER OF FAILURES IN THOUSANDS
PER CENT OF OUTPUT TO TOTAL CAPACITY

Forum on RE-EMPLOYMENT

■ EARLY IN 1938 a young man who had done a lot of thinking about our economic troubles, completed the formulation of a program which, if put into practice, would seem to provide for useful and profitable employment of all our citizens able and willing to work. He looked about for a proving ground for his ideas and found it in Stamford, Conn., a typical industrial community whose population is representative of the average for the country.

At Stamford he organized a group of young people which later was expanded to include voters of all ages. This group worked for the election of Republican candidates. Although the city had gone Democratic for 10 years, these Republican candidates were elected by an unprecedented majority in October 1938. In November the city went Republican by a majority of 4577, this being sufficient to swing the balance in Connecticut, the state going Republican by 2500.

The young man who contributed to this result in Connecticut, and who contributes this week's Forum article to STEEL, is Benton H. Grant. The entire basis of Mr. Grant's thought and program is embodied in his book entitled *The New Frontier,* published by Elektra Press, 420 Lexington avenue, New York. Mr. Grant graduated from Sheffield Scientific School, Yale University, New Haven, Conn., in 1933. He now is actively associated with a company connected to the iron and steel industry as well as serving as secretary of the industrial engineering firm of R. A. Lasley Inc.

—*The Editors*

■ HERE IS one horse-and-buggy tradition we should not have thrown overboard—the old American custom of doubling the national wealth at least once every 10 to 15 years.

In George Washington's time, estimates have it that the national wealth was about 1 billion dollars. A century of the old doubling habit and 1900 tipped the scale at 88 billions. Then 1914 turned up with 160 billions; 1926 with 362. According to this tradition, we should be somewhere between 600 and 700 billions today. But we are stalled at 350 instead.

The whole story of unemployment, a decade of trial and suffering, is summed up in that "350". We broke with the vital constructive process by which the face of the entire nation had been rebuilt and rebuilt and rebuilt from its earliest days. We took to raking leaves instead.

And it wasn't because we lacked the means to reach the "600" or "700" marker. We had the means—matchless natural resources, engineering skill, developing machinery, excess man-power—to have created these values. We just folded up when it came to the method. We "blew" the whole opportunity in relief rolls, in rotting homes and rusting factories.

Fortunately, it is not yet too late. We still have those resources, skill and man-power. We still have our democracy. The opportunity is still dangling before us. But we had better get going soon. If by 1955 we do not have what we might have had in 1939, it may be "curtains" for the order we have known.

There is only one way out. To start America Forward again, we must *build.*

Great advances in national wealth are primarily made up of lasting assets such as homes, railroads, highways, industries. These must be built on a tremendous scale, employing millions upon millions of hands in a continually expanding panorama of construction. In this process, unemployment fades away and general living standards rise. Earnings, commerce and opportunity become abundant in the land.

This sort of building is flat in America today and there is the nub of our problem.

Perhaps not the least of the obstacles is the smallness of our vision. When it comes to thinking in terms of undertakings large and profound enough in their effects to employ all our wasting resources and man-power, we become timid. We emulate the ostrich by burying our heads in the sand. We prefer to contemplate permanent relief rolls rather than great constructive ventures. We do not think out the details of what a 300 bililon dolar increase in the value of our homes, farms, cities, transportation systems and industries will mean because we are too sure these things are not in the cards.

However, there are other obstacles more substantial than this psychological one. Five of these may be briefly mentioned as follows:

Taxation which destroys initiative and vision;

Uncertainty over legislation hos-

tile to private enterprise;
Capricious labor troubles;
Restrictive monopolistic practices and high hourly wages in the construction industries;
Government competition.

But such considerations, largely favorable in the 1920's and easily overcome today whenever there is a mutual will for progress in government, labor and business, do not explain 1929.

Still more significant, when these conditions were favorable before 1929, the slums were getting worse. Development in transportation was at a snail's pace. Unemployment increased steadily after 1923. The farm problems already were chronic, reflecting a population pressure of people unable to find better opportunities elsewhere. A spectacular boom in office skyscrapers, which did not better the home conditions of the masses, only diverted attention from the general deterioration in the livability of our cities with their increasingly crowded streets and rising tolls of crime.

Something Was Wrong Before 1929

When—after the bubble burst—we took a look at the cities and countrysides of the early 1930's, we found that they were not appreciably better than those of the early 1920's. It appears that well before 1929 something had gone wrong with progress in the sort of real values which had been the backbone of the previous American tradition.

Careful analysis of the transportation, business and living structure of this country shows that the first signs of slack in this forward progress appeared in the 1880's. At first the national wealth continued to grow at a rapid rate because the slackening factors were offset by an extraordinary accelerating technical efficiency. But the slackening factors were there just the same, continually gaining momentum and pointing to an inevitable showdown whenever the offsetting factors would weaken.

One of the best indicators of this slackening process was the proportion of total man hours worked to man hours of life. About 1887 this proportion hit a stubborn long-term downgrade. Nothing like it had ever occurred before. Each decade saw the level lower. As hours first slid away from 108 per week, the new leisure was greeted as a boon. But as the trend persisted into the 1920's and 1930's, the decreasing employment became a calamity. Now as we sit on the side of this employment curve which looks like a toboggan slide pointing nose down into the 1940's, it is high time to get to the core of this 50 year trend.

Why was it that shortly after 1887

Benton H. Grant, Secretary
R. A. Lasley Inc., Industrial Engineers
New York

the great railroad building era drew to a close and the measure of railroad achievement became increasingly a matter of avoiding bankruptcy rather than laying rails in new rights of way? Was it really because the ultimate in rail transportation had at last been achieved?

Why—by the time of the Great War—had the difference between our potentialities and ordinary application become so great that we could gear up to supply a large part of the world with war materials and still have almost as much as usual for ourselves?

Then, when the War was over, let us remember how gearing down our productive mechanism to fractional levels of usefulness was so difficult that many of our farmers never did get acclimated again. Industrially, we junked fabulous fortunes. Financially, we had such excess powers that we spent much of the 1920's pouring our substance over the entire earth. In so distributing this huge volume of industrial production which we were not set up to consume at home we extended such a mountain of credit that when our debtors couldn't pay after 1929, our own operations boomeranged—delivering a staggering blow to us.

Constructive Powers Dissipated

Finally let us note again that our cities and countrysides were not getting appreciably better throughout that hectic period and the increase in long-term assets and national wealth was slowing down. Piecing all these things together, it appears that all the far flung efforts to unload our surpluses and scatter our substance to the four winds were evidences of "blowing off steam"—dissipating constructive powers which were not being used at home. Because she was not building up to higher and higher levels of civilization at home in accord with her capacities, America had to release her energies somewhere — hence the shorter hours, unemployment, war, waste, foreign credits, speculation, and finally the collapse and stagnation of the 1930's.

What then were the constructive works we should have undertaken instead of dissipating our powers? Why did we fail to undertake them?

The works we should have undertaken were high speed commutation lines in our large cities which would have brought outlying land 50 miles away within 30 minutes of shopping and working centers. We should have developed an effective method of slum clearance and urban rehabilitation. We should have been increasing the speed and reducing the cost of rail freight by an intelligent national attack on rail cost structures, by consolidation, by building short cuts through mountains, by easement of taxes. We should have developed urban highways and highway terminal facilities in proportion to the development of country and interstate roads.

All of these things vitally affect real estate values and building and failure to develop them makes the construction of a higher level of civilization in America impossible. None of the plans for the America of the future such as we see at fairs and engineering exhibits can stand up without them.

Yet our progress along any of these lines has been meager in proportion to our capacities for the better part of 50 years because we did not have the financial system or the enabling powers to go ahead.

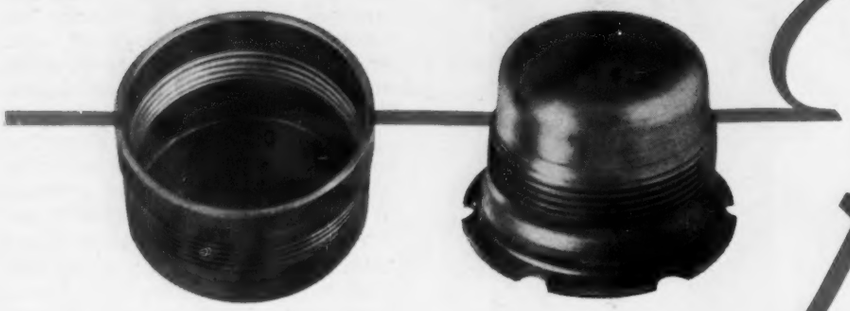
Corporations Curbed

It is no accident that this condition developed after 1887. Up to that time there had been a continual evolution in the financial system. Then the growth of corporations was suddenly confined to the maximum limits of the Victorian era. All forms of government subsidy and other direct public aids to enterprise were pared down to fractional levels.

These confinements of the business and financial system were necessitated by abuse of management privileges and by the threat of corporate control of government and virtual submergence of democracy. But the treatment was almost entirely negative — legislative restriction and nearly complete abandonment of public assistance to great undertakings.

As the time came when America should have been busy in the development of the transportation systems and constructive framework of a new order of civilization, there was no adequate method. The Victorian corporate order had never

(*Please turn to Page* 70)



Rolled For Hollow Metal

By H. A. UNKE
President
Wedge Protectors Inc.
Cleveland

Rolling of threads either on inside or outside vastly aids fabrication of wide variety of work. Process is suitable for automatic machines where high speed and large production are desired

■ WHILE rolling of threads is not new as applied to bolts and solid articles of that type, many attempts have been made to roll threads on hollow tubing with little success. However, a recent method developed by Wedge Protectors Inc., Cleveland, appears to solve this problem successfully.

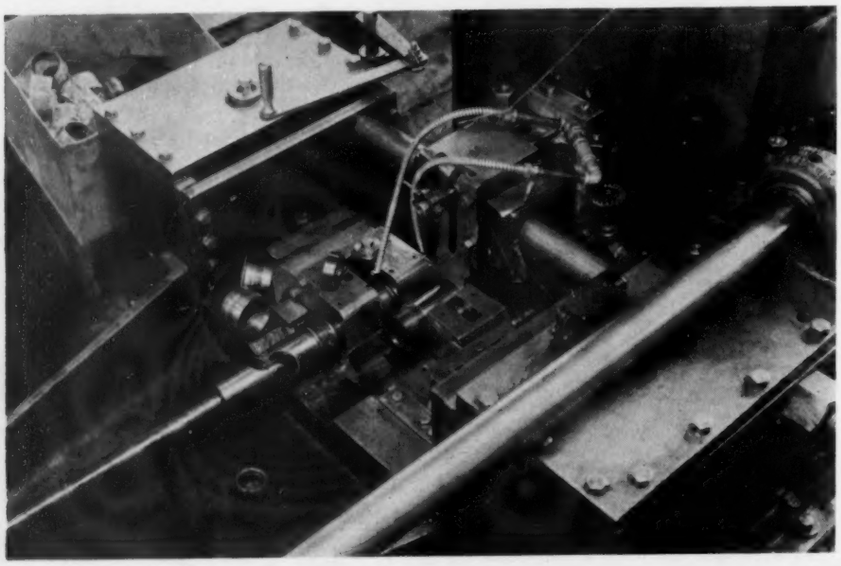
Already the method is widely used in manufacture of thread protectors which are screwed on ends of threaded pipe to protect the threads during shipment and erection. A large volume of these units has been in use recently. They have been found especially valuable in oil field work where the protector furnishes much needed protection for the carefully machined threads on the ends of the pipe and in the coupling.

As shown in accompanying illustrations, these protectors are made in a number of different types according to the size of pipe and the amount of protection needed. The more simple types consist of a steel cap with threads rolled inside of it, as at left above. Internal pipe threads are protected by plugs shown at right above. The heavy-duty types have a second piece of metal over the end of the protector to furnish additional reinforcement and protection. In any type, the threads are only rolled into a portion of the protector so the end of the protector can overhang the pipe threads and cover adjacent pipe area. Such protectors are applied to the pipe without the aid of a wrench and lock themselves to a stop.

The rolled thread used on these units is smoother than a cut thread and is perfectly true to size. It is rolled on the inside or outside of the protector in such a manner as to cause the threads to extend toward the interior. This is done by making the metal flow during the roll-threading operation. A specially designed thread is employed which clears the crest of the pipe thread. This prevents blows received by the protector from being transmitted to the thread of the pipe, thus affording maximum protection. Such units will stand a great deal of abuse.

No Metal Removed

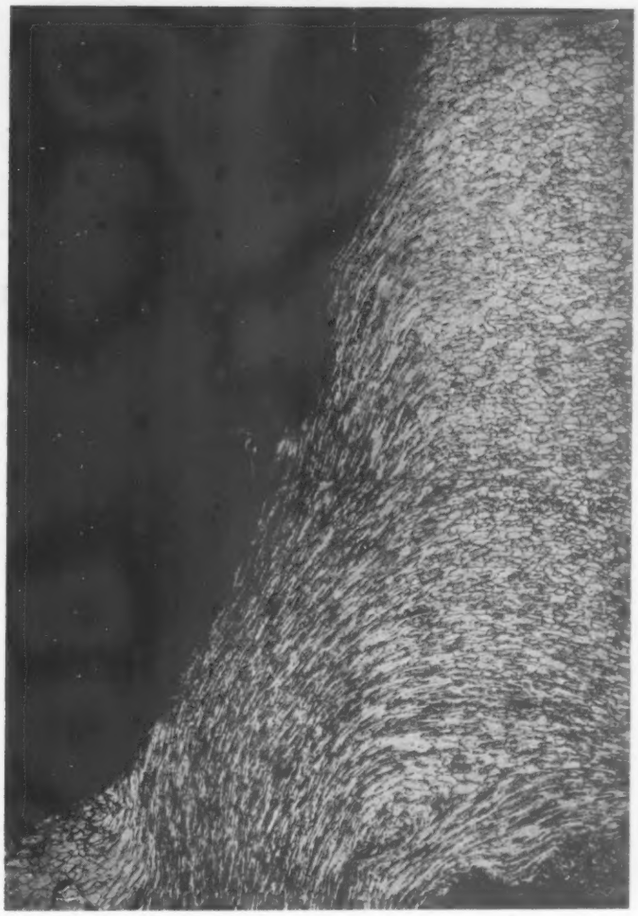
However, possibly the greatest field for this type of thread rolling lies in the threading of thin-walled pipe and tubing such as demonstrated at bottom of p. 41. The main advantage of a rolled thread applied either externally or internally is that no metal is removed during the operation. This assures maximum strength in the threaded portion. Also, it gives a thread of excellent characteristics since the metal itself flows to form the thread. Micrograph shows the grain structure in the parts containing threads formed by this method. It will be noted that



Upper left, metal cap used as pipe thread protector over ends of pipe during storage, shipment and fabrication. It has internal rolled threads. Upper right, stamped plug with external rolled threads used for protection of internal threaded pipe. Bottom, Automatic thread-rolling machine easily handles 1000 pieces of work per hour

Threads

Articles



the grain flows around the root of the thread and up into the crest.

It is easy to produce threads of varying shapes by this method. In fact, threads with square roots and crests can be made with little difficulty. Similarly, an almost perfect Vee can be formed if desired.

The method is widely employed in high production work, several machines being available which automatically roll threads at a rate of 1000 an hour. Of course, this production rate will vary with type and size of unit being handled. However, the method does lend itself to high-production operations.

Hand Tool for Thin-Wall Tubing

On the other hand, threads can be rolled into thin-walled pipe and tubing by means of a hand tool which is simple and easy to operate. This tool consists of a bushing held in a heavy frame and an arbor which fits on the inside of the tubing. The arbor forms a surface against which the threads are rolled and the bushing serves as a guide to maintain the tool in alignment. The tool operates something like a pipefitter's cutting tool. A hardened thread roll is screwed against the pipe as the tool is rotated.

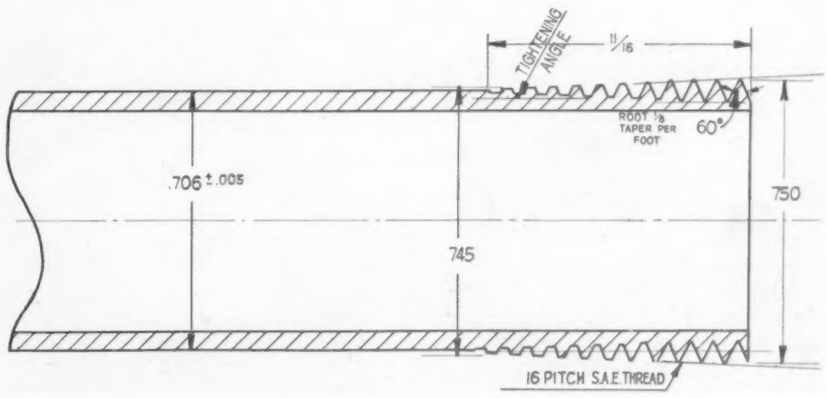
Operation is as follows; The threading tool is inserted over the pipe end, the adjusting screw is turned down to sink the roller block into the pipe. This is followed by rotating the tool, the adjusting screw being set down to bring the roller block to position where full threads are formed. The tool then is rotated in a left hand direction to roll the threads at the same time the tool backs off the end of the pipe.

Not only is the operation extremely fast and easy, but the threads formed are superior to cut threads since they are more uniform and are more accurate.

As yet the full possibilities of the process have hardly been scratched. There appear to be almost unlimited applications on various types of products requiring threads. In practically any fabricated article, there are a certain number of pieces of hollow parts which need to be threaded either internally or externally. The above method promises to afford an improved method of handling this work.

Wedge Protectors, Inc. has rolled threads in walls as light as 26 gage and as fine as 27 pitch for ⅛-inch pipe.

The latest development is rolling a taper thread with a taper of 3 inches per foot, 5 pitch in a 12-gage wall.



Upper right, micrograph of section through rolled thread. Note how metal flows to root and crest as indicated by grain structure. At right, details of typical rolled pipe thread. The tightening angle can easily be changed as desired. Metal is not cut but is forced up into thread crests

Improved Tempering

Successful operation of the first commercial austempering equipment shows process to have important possibilities. It imparts desired hardness yet retains toughness and ductility

■ THE FIRST installation for the heat treatment of steel by the austempering process (STEEL, March 15, 1937, p. 79) now is in successful commercial operation at the Worcester, Mass., plant of American Steel & Wire Co., Cleveland.

Austempering imparts hardness to steel along with the added desirable characteristics of toughness and ductility. Similar hardness is obtainable by the usual quench-and-temper method but steel so treated is somewhat brittle and lacks toughness.

Briefly, austempering involves heating the steel to a predetermined temperature, usually around 1575 degrees Fahr., until it becomes entirely austenitic. The steel then is quenched immediately in a salt bath at a temperature within the range of 350 to 800 degrees Fahr., depending upon the type of steel being processed. It is held in the quench until the product is completely transformed to bainite, the product of austempering named for E. C. Bain, United States Steel Corp., Pittsburgh. The work then is water quenched to room temperature.

The essential differences between austempering and the quench-and-temper method are shown schematically in Fig. 2. Where the latter method is used, the steel first is heated until it becomes austenitic. Then it is quenched in oil or water to give it a hard, martensitic structure. It is finally tempered by reheating to between 350 and 1000 degrees Fahr. for a predetermined period.

Application of austempering is confined to parts of relatively small cross section since the process is dependent for its success upon the rapid abstraction of heat. Products now being successfully treated include round and flat springs, retaining rings, lockwashers, link chains, rolls and sidebars, cutlery, electrical parts, golf shafts, firearm parts, shovels and forks, automotive, agricultural and business machine parts, small tools, spindles, bobbin rings and catches for textile machinery, needle bearings, etc.

Experiments now under way on automobile gears indicate that it will be possible to extend austempering to parts of larger cross section. Alloying elements have definite effect on thickness of material which may be treated, and further study is expected to reveal additional applications for the process.

All Steel Is Degreased

Layout of the Worcester installation is shown in Fig. 3, and this will be followed in describing the various procedures. All steel is degreased before being treated to improve the appearance of the ultimate product and also for the reason that oil might enter the salt bath as elemental carbon, with rapid ignition and burning. While not a serious hazard, the equipment has been engineered to eliminate this possibility.

The trichlorethylene degreaser is equipped with a storage tank and still with automatic temperature control. An elevator not only handles the work through the degreasing process but also lifts it to the charging level of the hardening furnace. Work is loaded into baskets at the receiving side of the degreaser at floor level and placed on a short gravity conveyor. These baskets have hangers which automatically engage the elevator.

Baskets are ejected at the top of the degreaser on a gravity conveyor, carrying them alongside a 12-foot belt conveyor which feeds the work

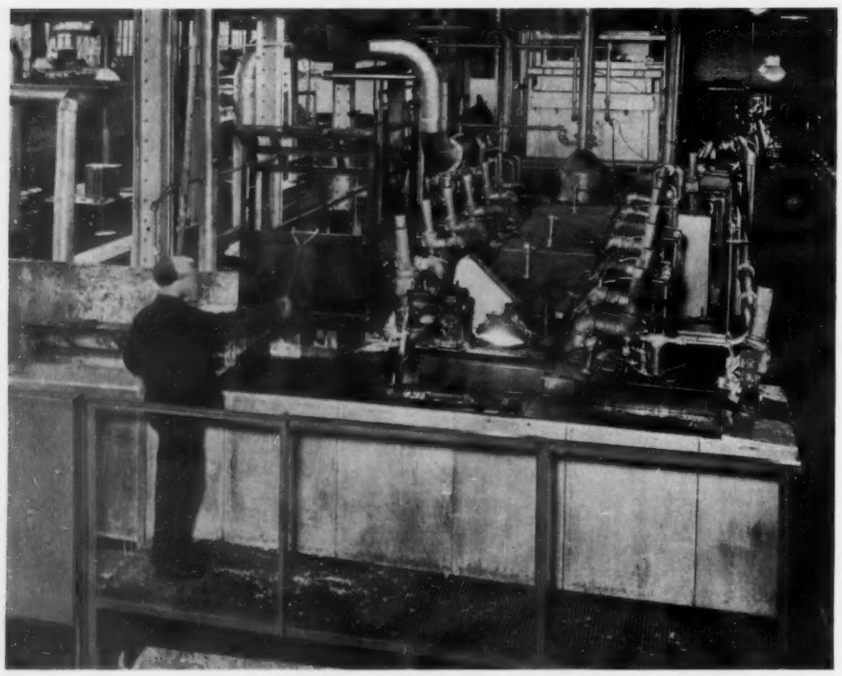


Fig. 1—Salt bath end of austempering furnace showing removal of work in baskets from T-shaped section

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into the furnace. Work is dumped manually and baskets are returned through a chute to the entrance side of the degreaser for reuse. The feed belt has a variable speed control so work may be distributed evenly and dropped on the hardening furnace belt at a rate determined by the type of work being processed.

Hardening furnace is a gas-fired radiant-tube controlled-atmosphere unit with the tubes completely encircling the furnace conveyor belt. It is designed for batch operation with a capacity of 500 pounds per hour. It is equipped with seven automatically controlled burners, controlled in four zones—one at entrance, one in center, one at discharge end where work drops into the salt bath and one over the salt bath chute to correct for black body radiation. Temperature in each of the four zones is controlled by a recorder-controller linked with combination air-gas valve controls.

TABLE I—Austempered Hardness Ceilings and Suggested Maximum Austemperable Sizes for Various Carbon and Alloy Steels

Type of Steel	C	Mn.	Cr.	Ni.	Mo.	Hardness Ceiling Rockwell C	*Max. Dia. Round (or equiv. sq.) In.
Carbon	0.95-1.05	0.30-0.50				57-60	0.148
Carbon (High Mn.)	0.95-1.05	0.60-0.90				57-60	0.187
Carbon	0.80-0.90	0.30-0.50				55-58	0.156
Carbon (High Mn.)	0.80-0.90	0.60-0.90				55-58	0.218
Carbon	0.60-0.70	0.60-0.90				52-55	0.187
Carbon (High Mn.)	0.60-0.70	0.90-1.20				53-56	0.281
Carbon (Very High Mn.)	0.60-0.70	1.60-2.00				53-56	0.625
Alloy	0.65-0.75	0.75-0.95			0.25	53-56	0.625
Alloy (C-Cr, 10100 K)	1.00	0.40-060	0.40-0.60			57-60	0.312
Alloy (SAE 4150)	0.45-0.55	0.60-0.90	0.80-1.10		0.15-0.25	52	0.500
Alloy (SAE 4365)	0.60-0.70	0.50-0.80	0.50-0.80	1.50-2.00	0.30-0.40	54	1.0 or larger

*Phrase "equivalent square" means a square section equivalent in area to that of the round.

Fine-Grained Steel Preferred

Operating temperature usually is held at 1575 degrees Fahr. to obtain complete solution of all carbides generally present in the annealed or spheroidized steels used for cold forming. Fine-grained steel is preferred, the relatively high hardening temperature then causing no austenitic grain coarsening.

Furnace conveyor belt is 25-20 chromium-nickel alloy mesh, 24 inches wide, 18 inches of which is actually used in operation. Effective heating length of the belt is 9 feet, and maximum clearing height at entrance is 2⅞ inches. From a mechanical standpoint, limitations on the work capable of being handled range from round pins, 3/32-inch in diameter and ½-inch long, to disks, 16 inches in diameter with formation no higher than 2⅞ inches. Flats down to 1/64-inch may be handled if their shape and mass provide enough rigidity to permit hardening in batch-type equipment. Speed of the belt may be regulated to provide heating time ranging from 5 to 25 minutes, depending upon size and composition of the work.

DX gas, generated in a 4000 cubic foot per hour unit and refrigerated to a dew point of 34 degrees Fahr., is used to obtain clean hardening. The gas moves toward the entrance end of the furnace where it burns and is exhausted through a large hood which covers most of the feed conveyor as well as the entrance. Average analysis of this atmosphere is 9 to 10 per cent carbon monoxide, 7 to 8 per cent carbon dioxide, 8 per cent hydrogen, 1 per cent methene and balance nitrogen along with a slight amount of water vapor. An analy-graph records the constancy of the furnace atmosphere and indicates needs for adjustment.

As the work passes from the hardening furnace conveyor, it drops down an alloy steel chute extending into the salt bath, thus making a perfect seal. Small parts drop directly on a conveyor in the salt bath

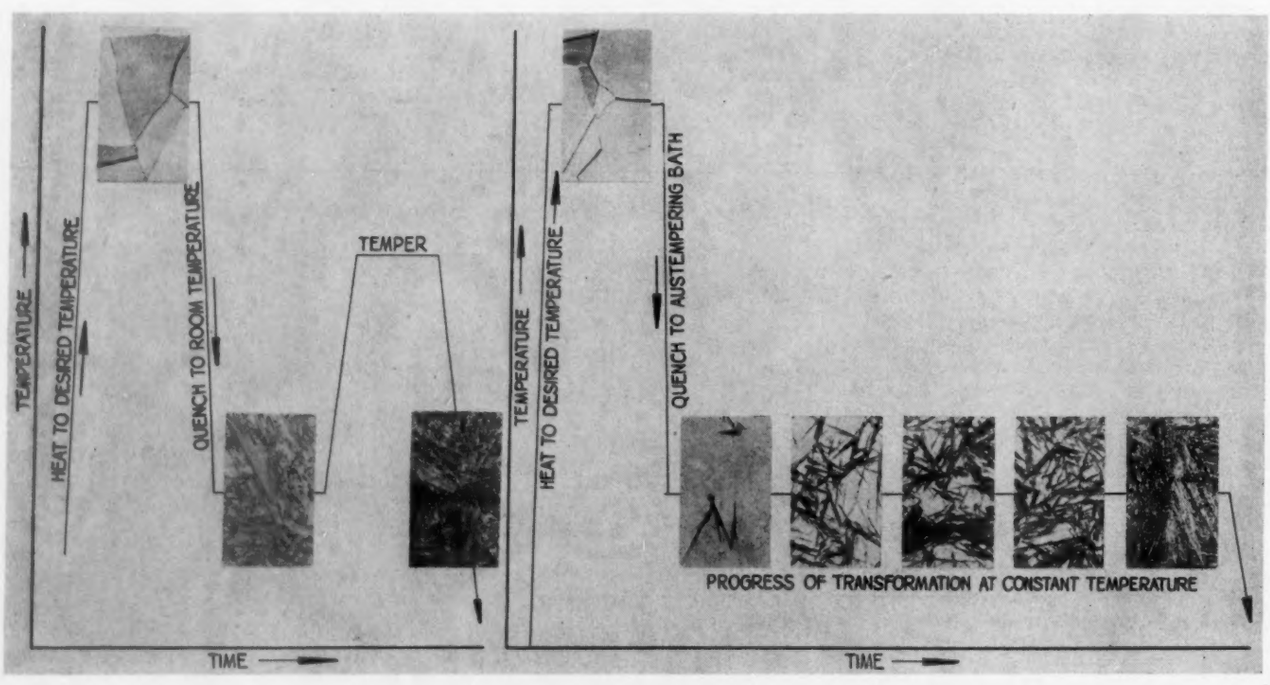


Fig. 2—Left, time temperature curve of usual quench-and-temper method showing grain structures at various points in cycle. Right, similar illustration of austempering process for comparison. Micrographs courtesy J. R. Vilella, United States Steel Corp. Research Laboratory

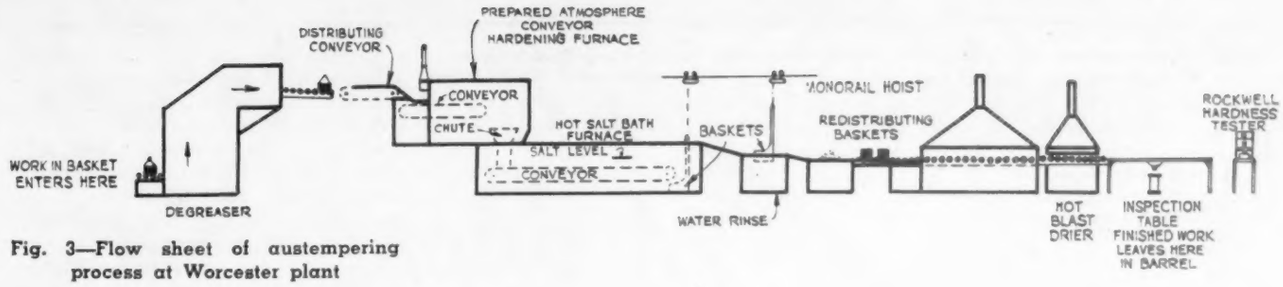


Fig. 3—Flow sheet of austempering process at Worcester plant

furnace but a slide, incorporated in the chute, is used when larger pieces are treated. Alloy steel was used in fabricating the chute and slide since carbon steel would tend to catalize the breakdown of carbon monoxide to carbon at temperatures below 1300 degrees Fahr. Such elemental carbon might be ignited at the surface of the salt bath by the hot nitrate with disastrous results.

The salt bath furnace is a continuous tempering unit heated with gas-fired radiant tubes. Bath itself is about 35 feet long, 3.5 feet wide and 2.5 feet deep requiring approximately 70,000 pounds of salt mixture, consisting of equal parts of sodium nitrite and potassium nitrate.

Entrance end of the tank is widened to permit rapid extraction of extra heat introduced by the work at this point. This cooling is accomplished by four propeller stirrers and auxiliary cooling tubes carrying air from a blower and operated automatically when temperature tends to become excessive. The exit is T-shaped and provides storage space for work requiring more time than provided on the conveyor belt.

Close Temperature Control

This furnace is equipped with 22 burners, 14 of which care for the main part of the furnace, two for the exit end and six for the enlarged entrance section. These are controlled by six recorder-controllers linked to an equal number of air-and-gas valve controls. Each control handles four pairs of burners starting at the exit end, while at the entrance end each of two controls handles three burners, two on one side and one on the other. Frequent checks have shown the temperature at the conveyor throughout the length of the bath to be accurate within plus or minus 5 degrees Fahr.

Except for the 25-12 chromium-nickel radiant tubes in the salt bath furnace, no alloy steels are used, the furnace lining and the conveyor of this furnace being fabricated from carbon steel. The conveyor is operated by a ratchet arm through the surface of the bath, eliminating necessity for glands and bearings in the furnace itself. Action of the ratchet arm is so rapid that distribution of work along the conveyor is extremely uniform. The relatively high 2.1 specific gravity of the salt bath permits the work to drop gently on the belt and also contributes to uniform distribution. Speed of the conveyor may be adjusted so work remains on it from 9 to 55 minutes.

Coming off the conveyor, work drops into baskets which may be left in the tank for another hour or two, if necessary. These baskets are fitted with roller-brackets and may readily be shifted in the end of the tank on a simple track arrangement.

Upon completion of treatment, baskets are removed from the tank by an electric hoist mounted on an overhead monorail and quenched in water which removes most of the adherent salt. Salty water from the quench tank is constantly pumped back to a salt reclaimer—fresh water replaces the salty water as it is pumped from the tank.

After quenching, the baskets are suspended over a redistributing or hopper arrangement nearby. Baskets have hinged bottoms, dumping being accomplished by pulling two pins with a single motion. The work drops into small baskets which pass through a hot water spray washer, a cold water rinse, a final hot water spray and a hot air blast drier. Baskets emerge from the drier on a gravity conveyor and their contents are dumped by hand on an inspec-

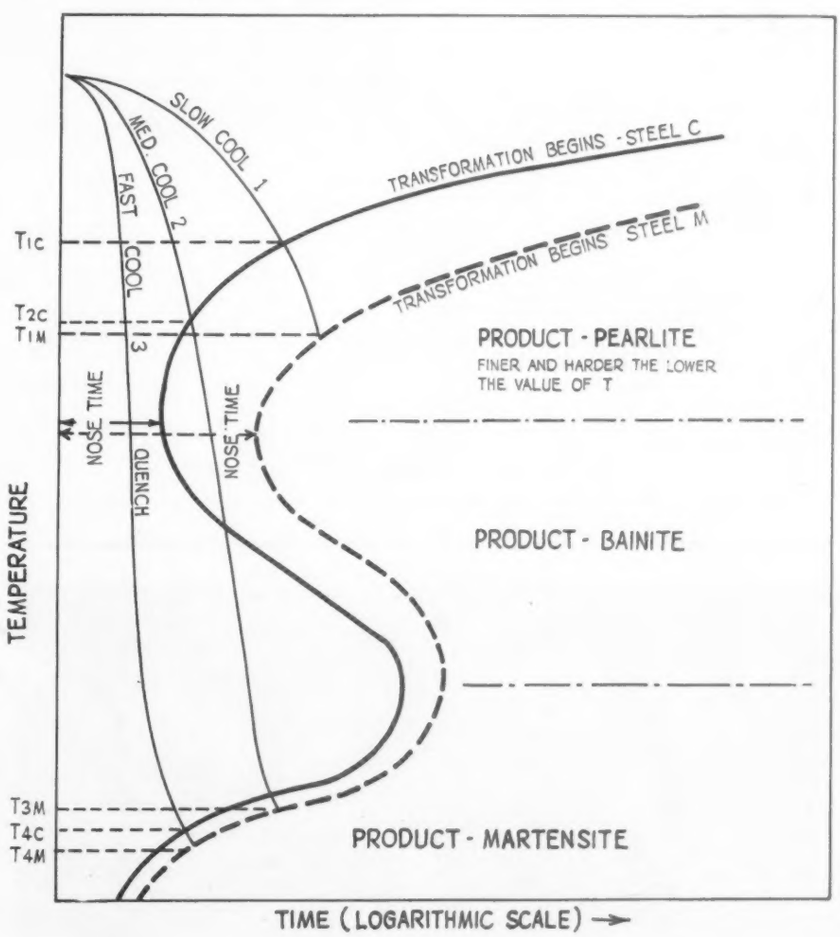


Fig. 4—Typical S-curves showing influence of cooling rate upon temperature and product of austenite transformation in a carbon steel (C) and a low alloy steel (M)

TABLE II—Comparison of Tensile and Impact Properties of 0.180 in. Round Rods Heat Treated by Quench-and-Temper Method and by Austempering

All results except those of the bending tests are the average of 3 determinations

(Courtesy United States Steel Corp. Research Laboratory)

Property Measured	Quenched and Tempered	Austempered
Rockwell C Hardness (flat surface)	49.8	50.1
Brinell Hardness (converted)	486	489
Ultimate Tensile Strength lbs./in.² (computed on original cross-section)	259,000	259,300
Rupture Stress, lbs./in.² (computed on reduced cross-section)	312,150	355,500
Elongation, % in 2 in.	3.75	5.0
Reduction Area, at fracture, %	26.1	46.4
Impact, ft.-lbs. (90 ft.-lb. hammer) Unnotched round specimen	14.0	36.6
Bending (free bend in ¾ in. length)	Ruptured at 45°	Greater than 150° without rupture

Analysis: C. 0.78; Mn. 0.58; Si. 0.146; P. 0.042; S. 0.040

Heat Treatment:

Quenched-and-Tempered	Austempered
Pb bath 1450° F.—5 min.	Pb bath 1450° F.—5 min.
Oil quench	Transformed in Pb-Bi bath
Tempered 650° F.—30 min.	at 600° F.—20 min.

Grain Size (1450° F.): 5-6, with 6 predominating

TABLE III—Comparison of Mechanical Properties of 0.180 in. Diameter Carbon Steel Rods Heat Treated by Quench-and-Tempered Method and by Austempering

(Courtesy United States Steel Corp. Research Laboratory)

Property Measured	Quenched and Tempered	Austempered	—Analysis, per cent— C.	Mn.	Si.
Hardness (Rockwell C. Flat surface)	50	50	0.85	0.42	0.180
Yield Str. (lbs./in.²) 0.1% set	224,750	210,950			
Tensile Str. (lbs./in.²)	261,100	256,700			
Elong. in 2 in. (%)	4.7	6.2			
Reduction Area (%)	28.3	44.8			
Impact (ft.-lb)*	20.4	40.2			
Hardness (Rockwell C. Flat surface)	45	45	0.74	0.37	0.145
Tensile Str. (lbs./in.²)	250,000	254,300			
Elong. in 2 in. (%)	6.0	6.3			
Reduction Area (%)	42.5	49.0			
Impact (ft.-lb.)*	41.1	No fracture			
Hardness (Rockwell C. Flat surface)	41	41	0.74	0.37	0.145
Tensile Str. (lbs./in.²)	226,300	224,700			
Elong. in 2 in. (%)	8.8	9.0			
Reduction Area (%)	42.7	54.2			
Impact (ft.-lb.)*	34.5	50.1			
Hardness (Rockwell C. Flat surface)	46	46	0.62	0.80	0.171
Tensile Str. (lbs./in.²)	253,700	248,000			
Elong. in 2 in. (%)	7.0	7.3			
Reduction Area (%)	46.2	50.4			
Impact (ft.-lb.)*	35.9	39.6			
Hardness (Rockwell C. Flat surface)	41	41	0.62	0.80	0.171
Tensile Str. (lbs./in.²)	223,700	225,000			
Elong. in 2 in. (%)	8.0	7.5			
Reduction Area (5)	50.3	56.4			
Impact (ft.-lb)*	37.4	45.9			

*Unnotched specimens, 0.180 in. diameter.

tion table. From here the work is dropped into barrels for further processing, if specified, such as oiling, tumbling or ball blasting.

Austempering about 500 pounds of steel per hour requires about 3500 cubic feet of 530-B.t.u. gas for the same period, 1200 of which is required for heating the hardening furnace, 1300 for the salt bath furnace and 1000 for making DX atmosphere. There also is available excess fuel capacity up to 4000 feet per hour, permitting the salt bath temperature to be changed at the rate of around 30 degrees per hour. Two men are required on each shift.

It has been found most economical to keep the salt molten over weekend shutdowns. This is accomplished by heating to a maximum of 800 degrees Fahr. and permitting it to cool at the rate of 20 degrees per hour, reheating when necessary. Estimated cost of operating this installation is believed to be about the same as for the conventional quench-and-temper method.

Has Limitations

Austempering has definite limitations. It cannot be applied successfully without a thorough knowledge of the transformation characteristics of individual steels and the so-called S-curve for each type. As previously indicated, the thickness of carbon steel which may be treated is limited since the success of the process depends upon rapid heat abstraction. However, it also is known that addition of alloying elements permits the use of slightly greater cross sections. The effect of alloying elements and cooling rate is shown in Fig. 4.

Knowledge of the nose time of its S-curve and of the cooling rate across the entire section of the treated part is necessary. Carbon steel C in Fig. 4 is cooled from its austenitic range at a rate corresponding to quenching curve No. 3 and passes the S-curve nose temperature without transforming, so the austenite may be transformed to bainite at any temperature below this. Cooling or quenching rates for the same steel represented by curves 1 and 2, which might correspond to the cooling rates near the center of a large section, fail to pass the nose time of the curve and the transformation is pearlite instead of the desired bainite. When this happens, the fundamental purpose of austempering—to obtain complete transformation directly to bainite—is defeated.

The substitution of low-alloy steel

(*Please turn to Page* 64)

Fig. 5—Entrance end of austempering furnace at South works, Worcester, Mass., of American Steel & Wire Co., subsidiary of United States Steel Corp., Pittsburgh

Out of the Witch's Cauldron comes *trouble* for turbine bearings

Air—water—catalysts—heat—pressure. That's the beating a turbine oil must take. To build a product that can stand such treatment *at all* is an accomplishment. But to put the proper grade in service, check it and watch it, and *keep it in service* for months and years until it pays for its cost, is the job Shell undertakes.

First there's the oil itself: Shell Turbo Oil. Research and refining, tied in with the experience of turbine builders and users, have produced an oil of unusual stability.

Next, Shell realizes operating variables require that even the finest oil be given every chance to succeed. **Hence Shell has created a staff of experienced engineers—thoroughly capable of giving *real help*, not their mere presence, to turbine manufacturers and users.**

And the Shell product and plan are working. We have enjoyed a substantial increase in business and gained the confidence of technical staffs in this field from coast to coast.

SHELL

SHELL TURBO OIL

Carburizing Compound

Unique conveyor affords important savings due to smooth handling which avoids degradation of material. Also aids packing, reclaiming and reconditioning of the compound. Special feeders automatically proportion new and used material

By N. W. ELMER
Redler Engineer
Stephens-Adamson Mfg. Co.
Chicago

■ PROPER HEAT treatment of small parts for automobiles such as shackles, pins, etc., is most important. At the Dodge main plant of the Chrysler Corp. in Detroit, a large volume of small parts is case hardened to give surfaces with maximum resistance to wear. Such heat treatment is done by the pack carburizing method where the metal parts are placed in a dry carburizing compound and heated in ovens to a temperature where the carbon is absorbed by the steel surfaces, increasing their hardness.

At this plant an unusual system of handling the carburizing compound has made possible important economies in amount of carbonaceous material consumed and also greatly facilitates packing the parts in the compound prior to placing the loads in the ovens.

For best results in carburizing, the compound must be kept as clean as possible, free from dust, ash and broken particles. Also a considerable amount of fresh material must be added when reconditioning the "carbon" to compensate for the amount absorbed by the steel parts during the case-hardening operation, as well as that actually burnt and also the loss due to degradation in handling. Studies of existing conventional systems for handling carburizing compounds show that as much as three parts of new compound are required to one part of old when reconditioning. With the Redler conveyors at the Dodge plant, only one part new material need be added to six parts of the old, effecting a saving in material of some 70 to 80 per cent. Also there is a saving in floor space as less area is required with the new system than for older types of handling systems.

Packed in Screened Material

The compound in which the parts to be carburized are packed is screened material, ¼-inch size and without fines. The presence of fines in the carbon mixture would prevent free circulation of air and would produce nonuniform results. The compound itself is a mechanical mixture of charcoal and coke.

Gentle slow-speed handling of this material is most important to prevent degradation. Any material

Fig. 1—Specially shaped alloy flights form links of chain which passes material causing it to slide in conveyor chute

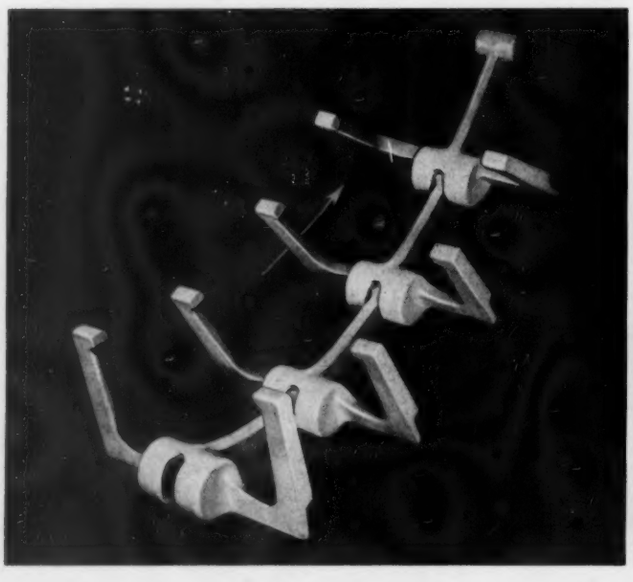
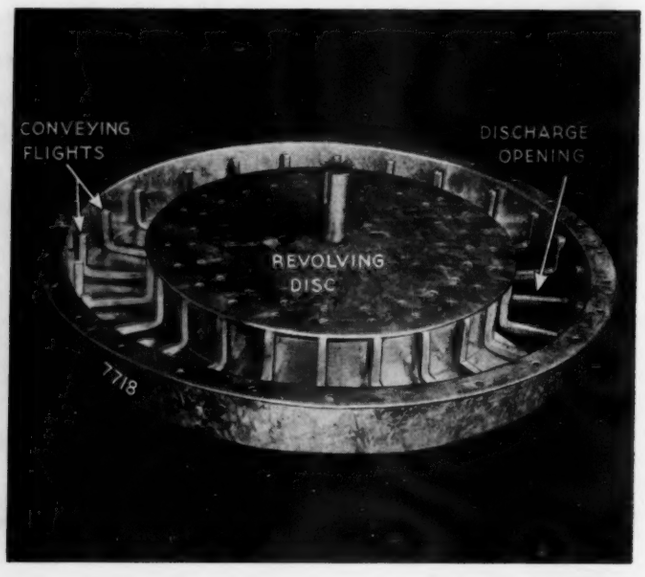


Fig. 2—Revolving disk forms an accurate volumetric feeder at bottom of bins Nos. 1 and 2 shown in Fig. 3



that becomes pulverized is waste and is lost during the screening operation.

Handling of this material without breaking the particles is made possible by a special type of conveyor. Principle of the Redler conveyor is that the shearing strength of any loose material is greater than the friction of the same loose material on the four sides of the smooth steel casing forming the walls of the conveyor. In other words, it takes less pull on the chain of conveyor flights to slide the whole mass of material along the smooth steel casing than it does to drag the peculiarly shaped chain links through the material. As a matter of fact, the chain in this particular type of conveyor floats in the material and does not touch the sides or bottom of the casing under loaded conditions except at bends.

A cross section of a typical flight unit is shown in Fig. 1. This affords horizontal as well as vertical travel. Such a conveyor can be fed from various feeding chutes without choking.

Flow of material at the Dodge installation is as follows: New compound is delivered into the receiving hopper at lower center of Fig. 3 feeding into conveyor No. 1 which carries the material a short distance horizontally and elevates it into overhead bin No. 1. Bin No. 2 contains the screened used carbon.

Under bins Nos. 1 and 2 are circular proportioning feeders detailed in Fig. 2. These units regulate the proportion of used and new carbon conveyed by the horizontal circuit conveyor No. 2, which loads the material into storage bins directly underneath. This conveyor is a continuous recirculating type which automatically maintains the bins at a uniform level.

Bins Feed into Pots

These storage bins have vertical spouts and undercut gates which allow the operators to feed the carburizing compound into the pots as they need it when packing the parts to be carburized. Packing of parts is done on a section of roller conveyor on which the large metal boxes or pots, rest during packing. Parts to be carburized are placed in the pots by hand and carburizing compound carefully packed around them so parts do not touch each other and so sufficient carburizing material surrounds each part to give uniform carburizing action.

After being packed, pots are transferred to the series of ovens, shown in Fig. 3, where they are heated at elevated temperatures to produce the desired case on the steel parts.

After heating, the pots are dumped onto the pan conveyor at the outlet end of the ovens. Here the metal parts are separated from the carburizing compound which is carried to the two vibrating spreader spouts indicated at point A at the lower right in Fig. 3. These spreaders distribute the hot material across the width of two vibrating corrugated water-cooled coolers which deliver the cooled material into the elevating conveyor No. 3.

Conveyor No. 3 travels horizontally underneath several other units and then carries the material vertically to a flop gate at the outlet chute of this conveyor. This gate permits the operator to discharge conveyor No. 3 into either the screen over bin No. 2 or into the week-end storage bin No. 7. In normal operation material discharges into the screen over bin No. 2, but during week-ends and other periods when amounts of ma-

(*Please turn to Page* 65)

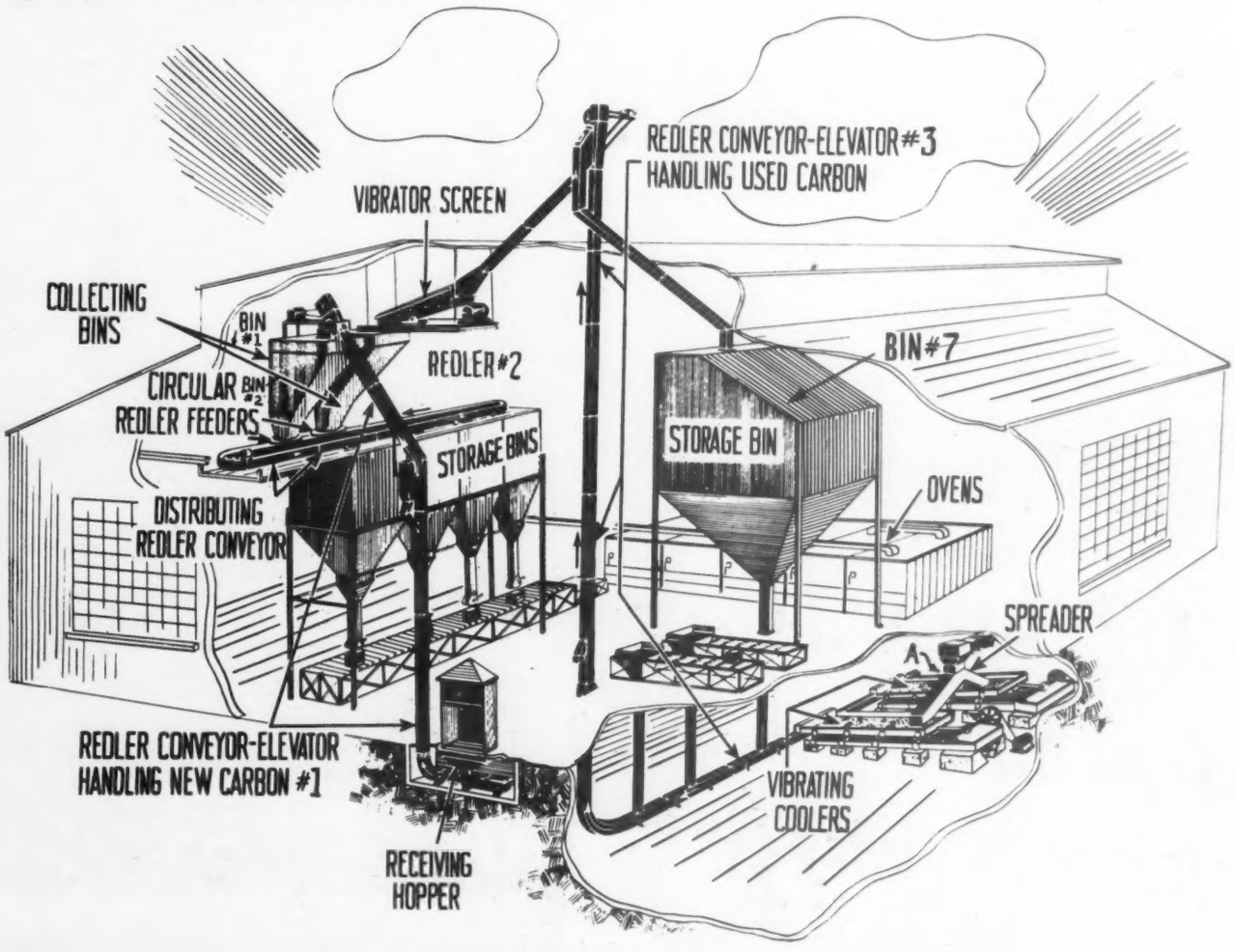
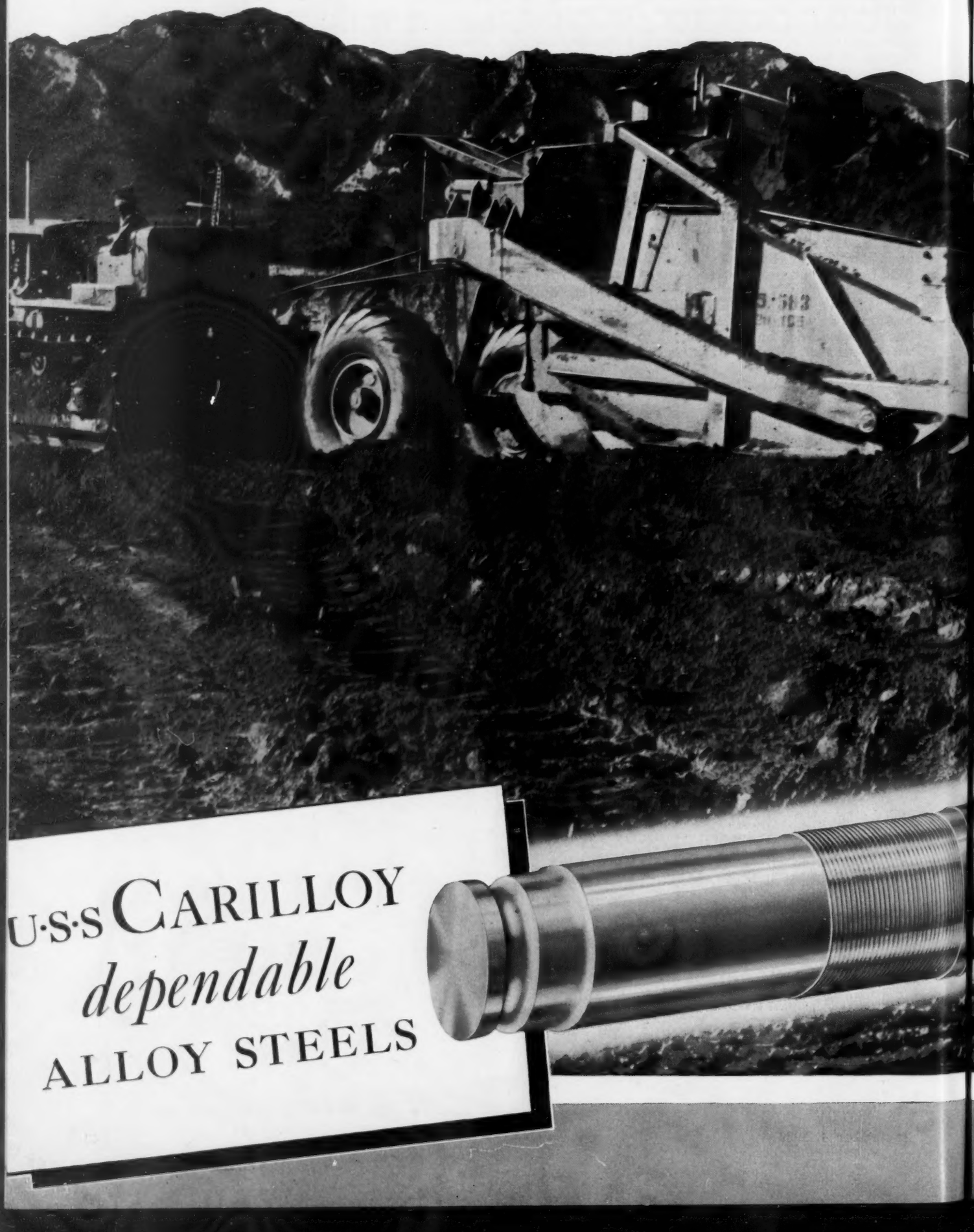


Fig. 3—Layout of conveyors, bins, pot packing table, ovens, reconditioning equipment, etc., for handling carburizing compound at Dodge plant, Detroit

In the *Vital Parts*



U·S·S CARILLOY
dependable
ALLOY STEELS

# of a Record Breaker

Equipped with tough axles of U·S·S Carilloy Steel . . . monster scrapers move more yards per trip, per hour, per dollar

ON this big job contractor's profits depended entirely on cutting dirt-moving costs. To strip the dam site, the outlet works and dikes for the Prado Dam, Santa Ana River, California, 4½ million yards of earth had to be moved—and moved fast.

A fleet of 25-cu. yd. ultra-modern scrapers was put to work. Each rig completed the 2700-foot average round trip 7.5 times, moved 150 yards every hour. Loading time 1 minute 25 seconds. Fuel consumption, 35 gals. of Diesel fuel per 8-hour shift, better than 34 yards per gallon.

But speed was not the only essential in this work. Equally important were *stamina* and *dependability* in every part of the equipment. U·S·S Carilloy Alloy Steel—S.A.E. 4140—used in the axles which bear the brunt of the load, assures a wide margin of strength and safety in these vital parts.

In U·S·S Carilloy Alloy Steels we offer you dependable, highest quality alloy steels that assure the utmost dependability in the parts made from them. These made-to-measure steels are produced by specialists who make fine alloy steels and nothing else—and whose aim is to give you the exact grade of steel that will do the best job for you at lowest cost. We welcome the opportunity to put our whole story before you.

• • •

(Shown below, axle for 25-yd. unit.) Wooldridge "Terra-Clippers" are built in nine sizes from 4 to 25-yard capacity, in all of which U·S·S Carilloy Alloy Steel—S.A.E. 4140—is used for the axles. U·S·S Carilloy Alloy Steel—S.A.E. 4140—is also used for the shaft of gears in the power control unit and in heat-treated form, is used in the axles of the ripper as well as in the ripper standards. Illustrations, courtesy of the Wooldridge Co., Sunnyvale, California.

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UNITED STATES STEEL

STAMPING

Overload Control

New safety control system has exceptionally high speed. Automatic press stamping 100 pieces per minute is stopped before third piece can pile on top of the second when press jams

By T. A. COHEN
Chief Engineer
Wheelco Instruments Co.
Chicago

■ A NUMBER of new controls and safety devices have been developed to prevent damage to dies and press mechanism in event two or more pieces of material are fed into a press instead of the single thickness for which dies may be set. While it is entirely possible to handle an overload in some presses and some die setups, those equipped with automatic feed mechanisms may experience damage of dies or press in event a piece jams and does not clear from the press and subsequent pieces pile up in the machine.

A new system was developed recently to prevent damage to the equipment in such cases. This system employs well-known principles of operation and standard equipment widely used for other control applications and so appears to offer a valuable method of safeguarding press operations, especially those in which automatic feeding and high speed are involved.

For instance, the system was recently applied to an automatic punch press used in stamping aluminum sheet. The aluminum stampings occasionally have a tendency to pile up, and when this occurs serious troubles result, such as die breakage or springing of shafts on the press.

This machine operates at the rate of 100 stampings per minute, and serious trouble begins if only three or four pieces are allowed to pile up in the machine. Thus the automatic control system must be extremely fast to be of any value. The press drive must be disconnected almost instantly if damage is to be avoided.

The principle upon which this automatic safety control operates is based upon the current drawn by the press motor. During ordinary normal operation, the motor draws a certain amount of power, with a fairly constant current. However, as soon as two pieces of material accumulate in the press, the added material greatly increases the power required for press operations, instantly increasing the current drawn by the motor from the line. At this point the control equipment goes into action, disconnects the clutch and shuts down the motor immediately. It actually stops the press before the third piece of material can pile on top of the second.

The key to this extremely fast operation of the control lies in the highly sensitive instrument used as an overload device to detect the increase in power the very instant it occurs. The controlling ammeter is of the Wheelco Capacitrol type. This instrument utilizes a small plate mounted on the pointer of the indicating instrument. When the instrument pointer carries this plate between two small coils, a radio circuit is detuned causing the control instrument to operate the motor contactor and clutch, shutting down the press.

In operation, the trip point of the instrument is set just above the normal current value required to operate the press. The pointer of the instrument is not used mechanically and does not have to make any contacts or set in motion any secondary mechanical apparatus. This accounts for the extreme sensitivity and high speed of the instrument so essential to the control operation here.

The instrument has a 25-ampere scale. When the motor is drawing its normal load, the pointer rests

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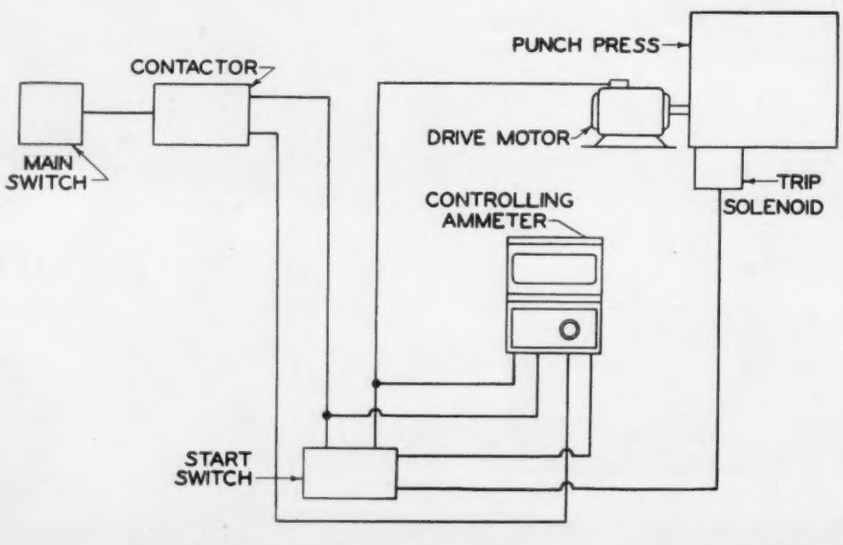
Single line diagram of safety control system described here employing a Wheelco Capacitrol as the controlling ammeter shown in the diagram



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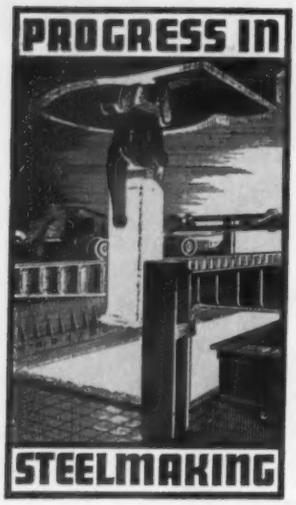


Flash Trimmers

An important part of equipment to join coil ends in feeding of continuous picklers and cold mills, new flash trimmers contain many advanced features, compensate for coil stock of different thickness and trim joint on bevel

By H. EARL MORTON
President
Morton Mfg. Co.
Muskegon Heights, Mich.

■ DEVELOPMENT of flash trimmers has come a long way from the first machines which were intended merely to strip off the loose material on top of the weld. A little later it became evident that close trimming was desirable on such flash-welded parts as drums, containers, etc. Gradually the trimmer has been built up as part of the processing line in close connection with the welding machine, especially on those types of applications for flash welding ends of coils of steel strip feeding continuous picklers and modern cold mills.

Newer machines such as those described here provide means for trimming the weld close to the thickness of the metal stock. A number of important principles have been outstanding in this development. Possibly one of the most important of these is the realization that the trimming machine is not merely a scraper but truly a machine tool. It must remove upset metal, which is apparent metal, so it immediately falls into the machine tool classification, machines that cut or remove metal.

Another factor extremely important in successful trimming is properly gaging the space or position of the tools with respect to the metal. Early experience taught that while large parts can be held to quite a definite thickness, when two pieces of metal of different thickness are welded together an entirely different condition exists from the very start.

Result was that it early was realized a successful trimming job involved means for automatically compensating for the variables in stock thickness.

Variations in stock occur not only from coil to coil but also from one side of stock to the other. To provide for this, the top tool-carrying member becomes also the member that carries the clamping dies.

From symposium on flash welding in continuous strip steel mills held recently at Taylor-Winfield Corp., Warren, O.

Clamping Dies Opposed

Upper and lower clamping dies are opposed and spaced apart in the open position a matter of approximately 2 inches. This gives ample clearance for entrance and removal of work and at the same time permits the return of the ram to loading position without dragging the tools on the work, an important feature. Trimming machine is designed similarly to a draw-cut shaper with one upper and lower ram. Both rams carry a series of tool holders in which are placed tool bit type of tools. Lower ram travels in a path parallel with clamping die surfaces. Top ram also travels parallel with the clamping dies. On this machine the upper ram unit is moved forward and away from the work by means of a roller bearing operated eccentric mechanism. Accompanying drawings and illustrations show shaft running through the length of the machine carrying heavy-duty roller bearings, the center of which is an eccentric member. Rotating the shaft through 180 degrees pro-

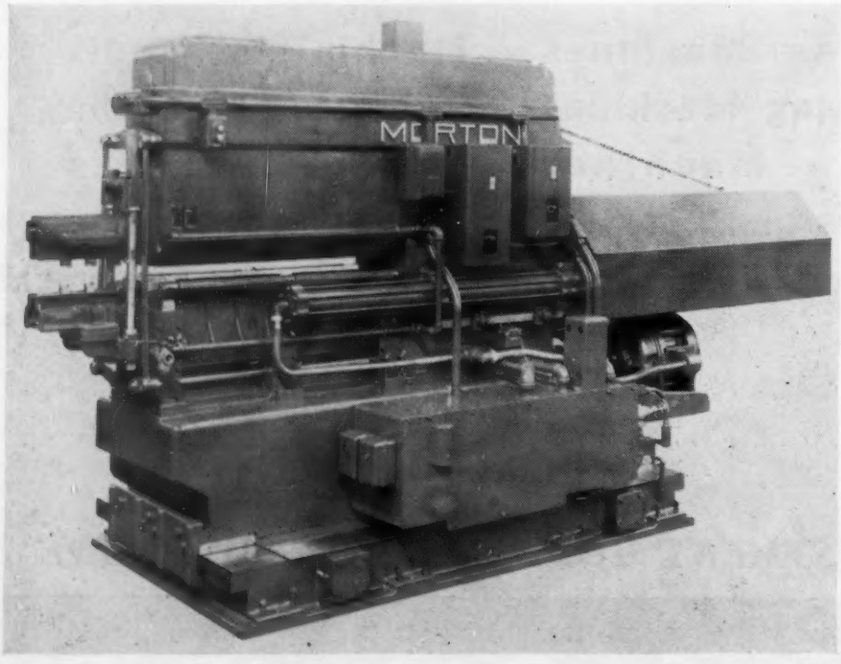
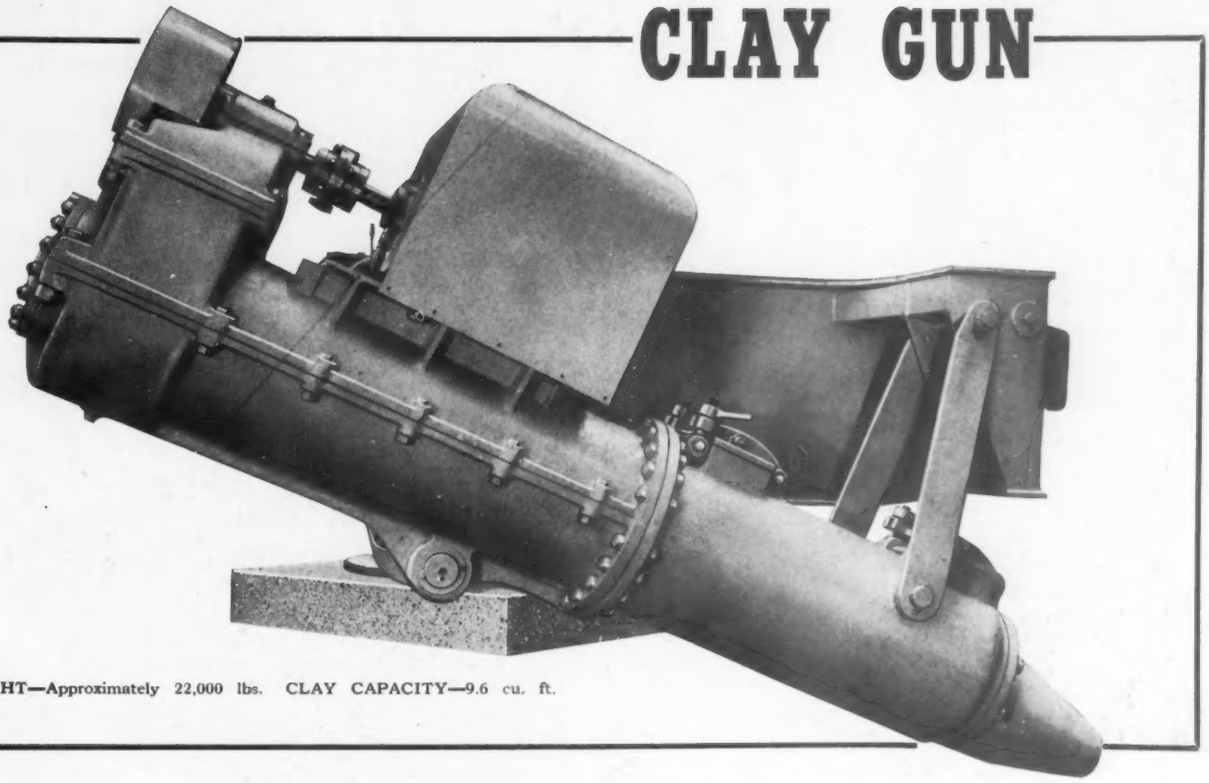


Fig. 1—Rams and clamping mechanism of this draw-out flash trimmer are hydraulically driven. The machine is aranged with 12 inches of horizontal traverse to permit quick alignment of machine with seam. Roller lifting equipment is synchronized with upper ram

THE BAILEY ELECTRIC PLUNGER CLAY GUN



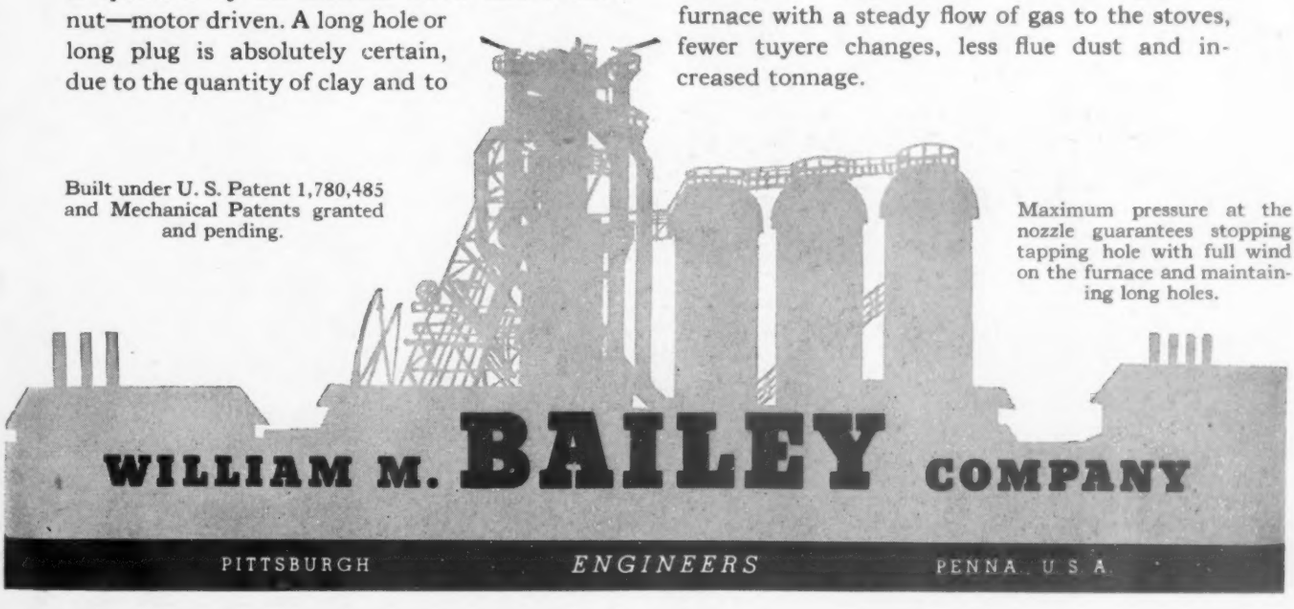
WEIGHT—Approximately 22,000 lbs. CLAY CAPACITY—9.6 cu. ft.

● THE BAILEY COMPANY marketed the original electrically operated Blast Furnace Clay Gun, with Independent Pedestal, in 1928 and are now offering an improved design of electric plunger type gun. The pedestal and carriage guarantees the movement of the gun in exactly the same path so that the nose of the gun always enters tapping hole. The plunger or piston is operated by an internal screw and bronze nut—motor driven. A long hole or long plug is absolutely certain, due to the quantity of clay and to the high pressure at the nozzle, which produces a denser, harder plug and makes for sureness and safety in stopping the tapping hole. Time required: 30 to 45 seconds.

This Gun will stop the tapping hole with full wind on the furnace at every cast. Continuous movement of the stock, due to the constant wind pressure, produces a smooth operating furnace with a steady flow of gas to the stoves, fewer tuyere changes, less flue dust and increased tonnage.

Built under U. S. Patent 1,780,485 and Mechanical Patents granted and pending.

Maximum pressure at the nozzle guarantees stopping tapping hole with full wind on the furnace and maintaining long holes.



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duces a vertical movement of about 2 inches. The eccentric is connected to the member which carries the upper ram. A heavy coil spring is included which gives sufficient clamping pressure to flatten the sheet.

Space and position of clamping member on the work is approximately the same as in the welder. Much less pressure is used, however, since sufficient pressure must be provided in the welder to avoid slipping of the work during upset, while in trimming it is only necessary to flatten the sheet and hold it against cross movement. On the new trimmer a hydraulic cylinder operates the roller bearing eccentrics to raise and lower the upper ram and clamp member. On machines where the seam to be trimmed is of greater length, raising and lowering upper ram is done by an electric motor with suitable worm gear reduction.

Not only do the rams and tools travel in a path parallel with the clamping surface, but in addition, means have been provided for the individual tools to be positioned at relative distances either toward or away from the clamping surface of the dies. This is necessary since a certain amount of stock must be removed in the shortest possible time in one cut. Therefore, cutting edges of tools are spaced or progressed relative to the clamping edge in a manner similar to a broach. Thus first tool may be set 0.020 to 0.025-inch below the clamping dies. Next tool may be set 0.010-inch below the clamping dies, the third tool 0.005-inch below the clamping dies, etc.

Another factor to be considered is the removal of the metal particles that have been burned off and deposited back on the surface of the strip during the flash-welding operation. This type of dirt (scale or flash) has a tendency to fly or peel away from the surface ahead of the cutting tool. Chips of this flying scale must be removed properly.

By means of the draw-cut principle, each of the cutting tools in the lower ram is preceded by an opening through which the material being removed can drop into space without getting into bearing surfaces. Material removed from upper rams travels across width of sheet and over the edge, also discharging through the openings in the lower ram.

Individual Designing Necessary

There are many factors in design of a trimmer which necessitate more or less individual design for a particular application. Some of these factors include variations in length of stroke to be trimmed, thickness of stock to be trimmed, various feeding methods, etc. Handling of material both to and from welder and trimmer presents a most important factor. The problem is to transport the welded seam to the trimmer in the least possible time and to center it properly in the machine. This is discussed more in detail in a separate article. (See STEEL, Aug. 28, 1939 p. 42).

Clamping is an important factor, especially in thin gages. Clamping in the trimmer is confined approximately to the same space taken by the welder jaws at the end of the upset in order to take advantage of the battening pressure built into the dies of the welder. A sheet is clamped full length of the seam as close to the weld as is possible.

For positioning the work after moving from the welder to the trimmer, some schemes of stopping the sheet automatically at the end of this movement have been tried employing rapid travel of the sheet between the welder and trimmer with a slow rate for a distance of approximately 3 to 4 inches just before the weld reaches the center of the clamps. With such automatic transport, it is not easy to center accurately and so the new trimmers may be provided with a horizontal motion to compensate for any variation that may occur. These machines, Figs. 1 and 2 are built with a 2-part base, the entire machine sliding on the lower portion. A motor located on side of the machine, Fig. 2, drives screws which afford a movement of 6 inches either way from the approximate center. Observation has shown that it is possible to stop a sheet perhaps 80 to 90 per cent of the time with slow-down method and center it accurately. The other 10 or 20 per cent of the time it is necessary to make some adjustment. It has been found easier to make this final adjustment by moving the trimmer than it is to start the heavy pinch roll equipment and move the sheet. This cross travel is provided at a rate of 4 feet per minute, and it is only necessary to move the machine a matter of an inch or so, so this compensation involves little lost time.

Cycle of operation of this trimmer is as follows: When sheet is positioned, operator pushes a button. Upper ram and clamp member move down into the clamping position. As soon as the clamping position is reached, both rams start to move automatically in the cut direction and complete the trim in one movement. When end of trim is reached, a trip mechanism reverses the action and unclamps the work. The rams start back and travel to the loading position where they stop automatically. As soon as upper ram and clamps have moved away from the sheet in unclamping, it is possible to remove the work.

In trimming a weld joining strips of different thickness, the clamping pressure is divided by both the dies. Pressure is applied directly over the center or top dies and equalized between the two lower dies. In setting the tools for trimming, the trimmer is made so that if there is a continuous condition of a thin sheet being welded to a thicker sheet, an offset can be made in both lower and upper dies to get an average condition so as to gage from the thinner of the two.

The cutting tool in such an instance would be set at a level corresponding to the thinner of the two gages. Since the tools have a certain amount of radius, they would trim out into the thicker stock and thus trim the weld on a slight bevel as mentioned earlier.

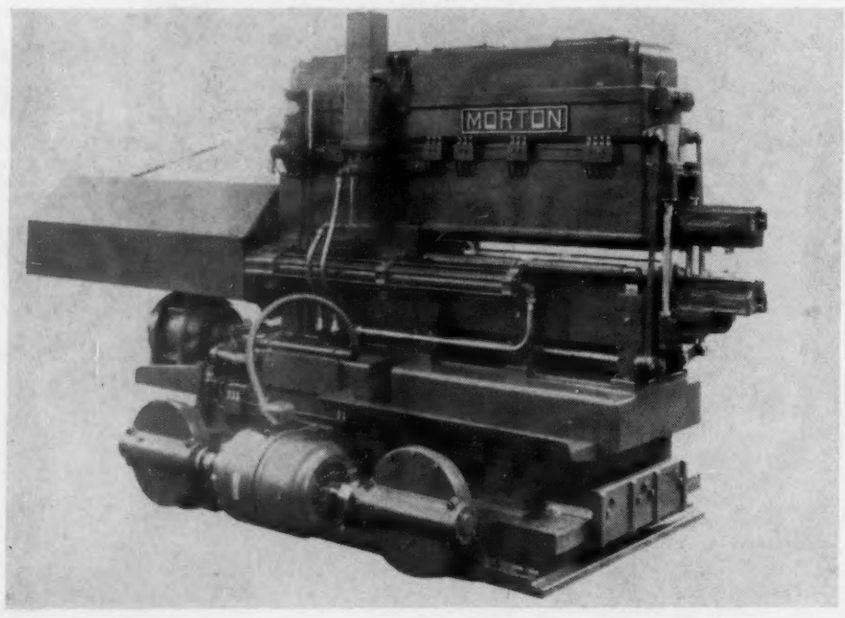


Fig. 2—This view shows horizontal traverse motor drive. An electrical driven cutter grinder with gages and fixtures for maintaining cutting tools assures minimum cutting tool costs

Gearmotor Drives

Offering the advantages of a simple, compact, totally enclosed drive, gearmotors appear to warrant much wider use than present applications. Units made in types, sizes and output speeds suitable for all low-speed drives up to 75 horsepower

By C. B. CONNELL
Application Engineer
Gearing Division
Westinghouse Elec. & Mfg. Co.
East Pittsburgh, Pa.

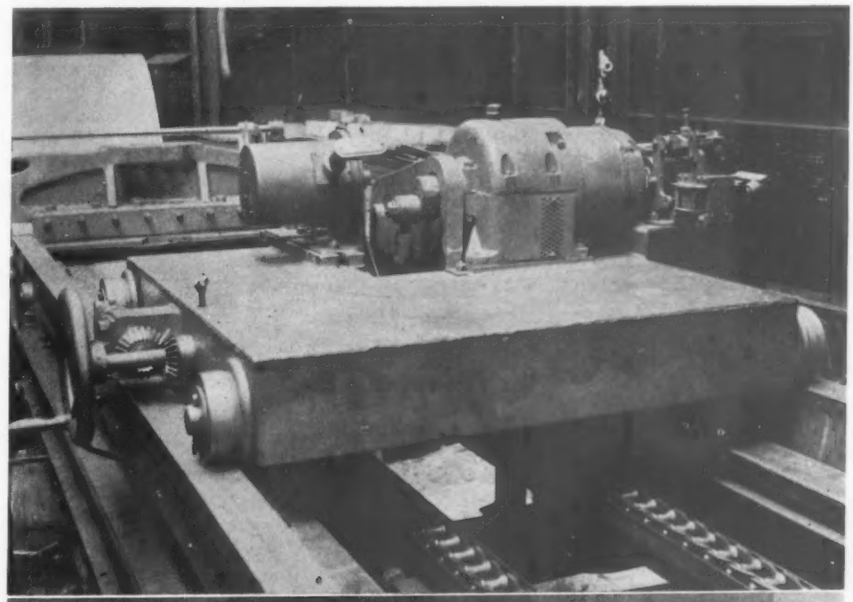
■THE APPLICATION of a standard gearmotor often simplifies a power drive considerably. A special gearmotor or a standard gearmotor with some modification often can be made an integral part of the driven equipment. A number of advantages accrue, including the ability to obtain different speeds in a small unit, thus permitting the driven equipment to be operated through a considerable speed range. In addition to ordinary variable-speed direct-current gearmotors a wide variety of 2, 3 and 4-speed gearmotors for alternating-current service also is available.

Gearmotor manufacturers list gearmotors in sizes ranging from fractional horsepower up to 75 horsepower. Output speeds range from approximately 4 to 1550 revolutions per minute. In addition, gearmotors are available for almost any type of mounting arrangement including floor, sidewall, ceiling and flange mounting horizontal units as well as vertical types. Besides being made with nearly any standard type of motor, gearmotors also are furnished in special types for either alternating or direct-current power and with the usual motor enclosures.

Application of the gearmotor to the driven equipment can be made by means of a flexible coupling or clutch, overhung pinion, pulley, chain sprocket or other various devices.

Principal advantage of the gearmotor is that it affords an economical combination of high-speed low-cost motor with a means of reducing motor speed to coincide with the

Abstract from address at Machine Tool Electrification Forum, April 18, 1939, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.



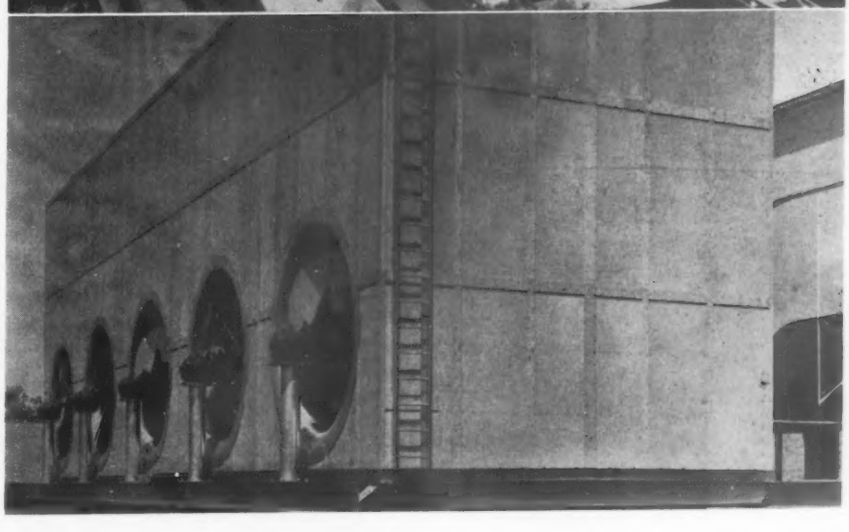


Fig. 1. (Upper)—This ½-horsepower gearmotor with motor-mounted brake is mounted on a movable platform and operates the gage that determines length of sheet cut on a cut-to-length and squaring line in a sheet mill. Fig. 2. (Lower)—Group of gearmotors driving cooling tower fans. Totally enclosed, they easily withstand exposure to the weather

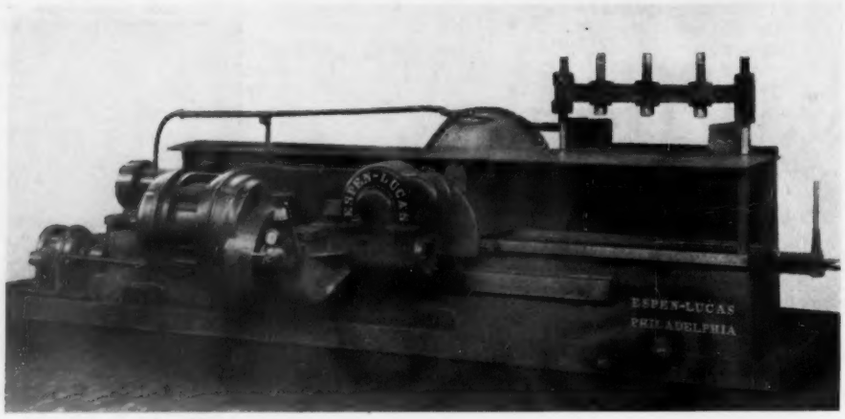


Fig. 3—This 25-horsepower gearmotor has four output speeds of 772, 514, 386 and 257 revolutions per minute. It drives a metal cutting saw

speed of the driven equipment. With the drive enclosed, gears are not only protected from accumulations of dust and dirt, but a supply of lubricating oil or grease is readily available. Also, entrance of extraneous material into the gearing is prevented. The hazard of open gearing also is nonexistent with a gearmotor drive.

Made from standard parts, all carefully checked, gearmotors today involve no undue maintenance and thus afford a reliable, efficient, low-cost drive on many applications.

Westinghouse gearmotors as well as others are designed on the basis that the gear parts will transmit the maximum torques delivered by the motor to assure confidence in the drive application. Thus, if the motor itself is chosen properly, there need be no concern for the gear parts from the standpoint of their ability to transmit the torques developed.

Gears Cut After Heat Treating

Rotary-type shaving machines for shaving gear teeth after cutting have proved valuable to the gear manufacturer. It has been found by careful analysis that the shaving of gear teeth that have been cut after heat treating enables the gearmotor manufacturer to approach a more uniform degree of accuracy without slowing up production schedules. One of the largest rotary cutter-type shaving machines yet built is used in this service at the Westinghouse plant. Gears are produced regularly on this machine which check within a couple of ten thousandths for tooth spacing, lead and contour.

One of the requirements of successful gearmotor application is that the gear noise level be held within certain limits. Sometimes these limits may be quite severe, so sound level determinations and reduction of noise form an important part of gearmotor manufacture. Gear motors within the limits mentioned above are often required to meet sound level requirements. Westinghouse gearmotor gears have diameters finish-ground with the teeth cut and shaved after being pressed on the shaft to eliminate any error which may result from pressing the gear on the shaft after finishing the gear teeth. This accuracy aids in supplying gearmotors for applications which require a high degree of smoothness and quiet operation.

In Fig. 1 a gearmotor with a motor-mounted brake is applied to a cut-to-length and squaring line in a sheet mill. This ½-horsepower gearmotor has an output speed of 95½ revolutions per minute. It is mounted on a movable platform and operates the gage that determines the length of sheet to be cut. Compactness and simplicity of drive feature this application.

Fig. 2 shows a group of gearmotors driving cooling tower fans. These units are a totally enclosed fan-cooled type, suitable for mounting where exposed to weather as here. They are mounted on steel pipe pedestals with a flat plate welded at top and bottom. This type of pedestal has a tendency to vibrate and accentuate any gear noise. On cooling tower applications, especially those for office buildings, the sound level of the gearing must not exceed that of the motor. Here the gearmotors make a simple compact totally enclosed drive capable of withstanding exposure to weather.

Makes Compact Drive

Fig. 3 illustrates another extremely compact drive arrangement. Here a gear motor is used on a metal-cutting saw. Motor feet are mounted to the side of the machine. Gearmotor is connected to the driven part of the machine by an overhung pinion on the output shaft. This arrangement certainly uses a minimum of space. Without viewing the drive carefully, it is hard to tell where the gearmotor ends and where the driven machine begins. This is a 4-speed unit rated 25-horsepower with output speeds of 772, 514, 386 and 257 revolutions per minute.

These few applications of gearmotors do not in any way show limits of gearmotor adaptability. Gearmotor application is really in its infancy, although engineers laying out power drives already have utilized savings in money and space they afford in a wide range of industries and drives. As a means to obtain a compact, efficient main or auxiliary drive, they have many points making them worthy of consideration.

•

Porcelain Enamel Group Devising Standard Tests

■ Porcelain Enamel institute's committee on standardization of tests met in Washington recently to review its plan for development of standard tests for the porcelain enamel industry. Procedure was discussed with special reference to work being carried on at the national bureau of standards.

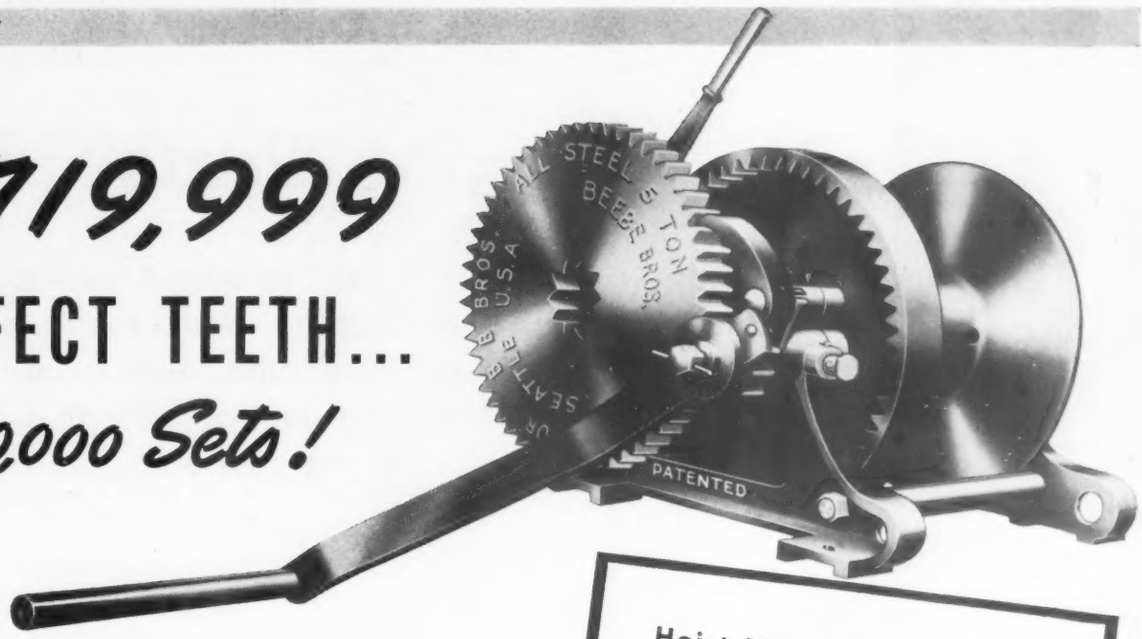
One of the principal problems considered was development of commercial tests that will be useful in shop practice, as distinguished from standard tests developed for research and laboratory usage. The committee recognized need for such standard commercial tests, which should be correlated closely with the more precise standard laboratory tests but should be easily and quickly applicable in shop work.

Two of the standard tests already adopted by the institute are subdivided into "research" and "commercial tests that will be useful in this principle and extension of it in future work will give the manufacturer valuable product control tests. At the same time standard research tests will continue to be devised with a view toward further technical development.

The committee revised its operating plan to provide for formation of a subcommittee to formulate each standard test it undertakes. Such subcommittees will consist not only of members selected from the parent committee according to their special interests and freedom to participate actively in experimental work, but also of additional members selected from the industry on the same basis.

The committee voted to restrict its activities to tests that are applicable to enameled metal articles, and recommended that another committee be appointed to handle tests applicable to earlier stages of manufacture. The latter would include, for instance, tests for such determinations as strength of cleaning and pickling solutions, fineness of enamels, and similar process control requirements. One of the special problems now being explored is development of a standard color test, for which a subcommittee was appointed some time ago.

3,719,999 PERFECT TEETH... 20,000 Sets!



Hoist Manufacturer makes these Statements Regarding Steel Castings

"Strength concentrated where needed. Reduced thickness in parts involving no strains. Fewer parts — parts preassembled in castings. Less waste of material in finishing. Castings true, uniform, clean and smooth. Time saved in machining, drilling and finishing. Great weight saving without sacrifice of strength and ruggedness."

Over twenty thousand of these 5-ton hoists are in daily service. And of the 3,720,000 teeth in their gears, only *one* single tooth has ever been reported broken!

It's hard to imagine even a much more costly gear matching that perfect record.

In making this hoist of steel castings, 1690 pounds of weight are saved over the former design. 110 pounds does the work of 1800 pounds. And does it better!

The manufacturer challenges his customers to break any part of the hoist if rated capacity is not exceeded, and *they haven't done it yet*.

Your business will grow — no matter what you make — if you produce a better product at lower cost. Steel castings are making just that contribution to thousands of users. More and more steel castings are today proving their great value — over a million tons a year.

Discuss this important subject with your local foundry. Or write to Steel Founders' Society, 920 Midland Bldg., Cleveland, for money-saving suggestions.

IMPROVE YOUR PRODUCT WITH

STEEL CASTINGS

Engine Parts

Welded parts are changed to afford maximum benefits from use of welding. As a result, cost of making water jacketed manifolds is cut 47 per cent. Manufacturing cost of oil pan is reduced by 45 per cent also

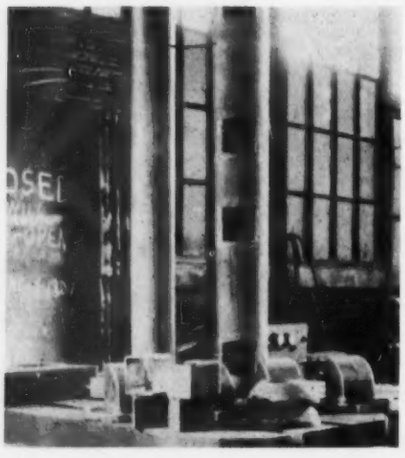
By EARLE S. LEE
Welding Foreman
Buda Company
Harvey, Ill.

■ QUITE OFTEN the failure of cost of a welded design to compare favorably with other types of construction is due to lack of a thorough understanding of how best to take full advantage of possibilities of welded construction.

Two excellent examples of this are presented here with details on how the fabrication was changed to realize the full benefits of welded construction from a view of lowering costs. Of course other factors such as lower production time, added flexibility and other features of welding may often result in the decision to use welded construction. At the same time, it is well to take full advantage of whatever cost savings may be possible.

As originally designed, a water-jacketed exhaust manifold consisted of an inner casing, 3½ inches in diameter and 38 inches long; an outer casing, 4½ inches in diameter and 39 inches long; two cast steel flanges, threaded inside for 3-inch pipe; four pieces of fabricated square tubing; four cast steel elbows, milled and drilled to fit cylinder exhaust port studs; and two cast steel bosses, used as water inlet and outlet ports.

Fig. 1—Inner and outer sections of manifold with square holes cut in outer section



Outer and inner casings were laid out and marked for the four pieces of fabricated square tubing used as conductors of exhaust gas into the inner casing. These square holes then were cut in the inner and outer casings with a torch. The square tubing was welded into the holes cut in the inner casing. The two cast steel threaded flanges then were assembled and welded to the ends of this casing.

To assemble the outer casing, it was split in half and the halves fitted around the square tubing and the threaded flanges. To prevent warping of outer casing, it was milled and two halves ground to fit around the four pieces of square tubing, clamped and welded in place. Using this method, all welding on the inner casing assembly was inaccessible and could not be repaired if a leak should develop after the manifold was placed in service.

To finish the manifold, cast steel water inlet and outlet ports were placed in position and welded to outer casing. This was followed by assembling the cast steel elbows to a cylinder block to keep them in proper location while the rest of the manifold was clamped to them and welded to the elbows.

It was evident to the welding department that if the above procedure was followed and any number of these manifolds were constructed, the entire job could be made of cast iron at a price the welding department could not hope to meet. Accordingly fabricating procedure was changed in the welding department, and as a result 47 per cent of the manufacturing cost of this part was eliminated. In addition, appearance was improved and all welds are completely accessible, thus greatly facilitating repair in event a leak develops.

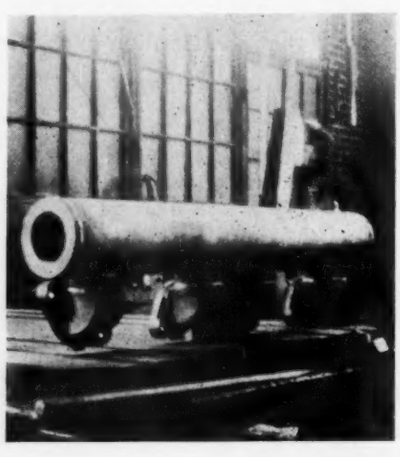
From paper receiving $508.77 award in Automotive Engines classification of $200,000 Program sponsored by James F. Lincoln Arc Welding Foundation, Cleveland.

Parts Arranged Differently

The new procedure employs the same parts but arranged differently. Layout work on the inner casing was eliminated. This part only requires burring of the ends before ready for assembly as these sections arrive in the welding department cut to proper length.

Outer casing was laid out for the four pieces of fabricated square tubing which conduct exhaust gases from cylinders to the inner casing.

Fig. 2—Completed manifold with cast steel elbows attached



These four square holes are cut with a torch in the outer casing only. Inner holes are cut later.

Inner casing, the two cast steel threaded flanges and outer casing are assembled in a clamp, tack-welded and the clamp removed. Welding on the inner casing at threaded flange was done on the inside of the casing and flange through the threaded hole.

The four pieces of fabricated square tubing next are cut and ground on one end to conform to the outside contour of the inner casing. Then they are inserted in the square holes cut in the outer casing. As no cutting has been done yet on the inner casing, the tubing rests on this inner section which still is intact. Then the square tubing pieces are welded to the inner casing on the inside of the tubing.

After this welding is done, that portion of the inner casing covered by the square tubing is cut out with a torch using the square tubing as a guide and cutting through the weld. This does not leave an obstruction to the passage of exhaust gases as the fillet weld employed leaves a rounded surface instead of a square corner.

Next, the square tubing is welded to the outer casing on the outside of the tubing. The manifold is finished by welding the cast steel inlet and outlet bosses in proper location, sand blasting the unit and testing for possible leaks. Final operation is assembling the four cast steel elbows as before.

The story of cost reductions by the changed fabrication method is contained in the following figures: Cost of manifold as originally designed—$20.75; cost of manifold by revised procedure—$11.00; saving accomplished by the change—$9.75 or 47 per cent. Fig. 1 shows a manifold in the process of construction and Fig. 2 shows a completed manifold.

Consider Ease of Assembly

The arc-welded steel oil pan shown in Figs. 3 and 4 and described below is used on the same engine as above manifold. Construction, welding procedure and various individual parts of this pan were changed to reduce cost of preparatory machine work, cost of assembly and welding and to produce a product of neater appearance. These changes in design and procedure were made in the welding department to benefit more completely from the possibilities of welded construction. In designing for welding, ease of assembly and welding must be considered as well as amount of preparatory machine work.

Oil pan is made from two steel castings used at front and rear ends, one bottom sheet of 12-gage annealed steel, right and left hand side sheets of same gage material, one right and one left hand ledge, one drain plug boss with a 1-inch pipe plug, tap, a baffle plate, and a steel casting used as cleanout plate boss.

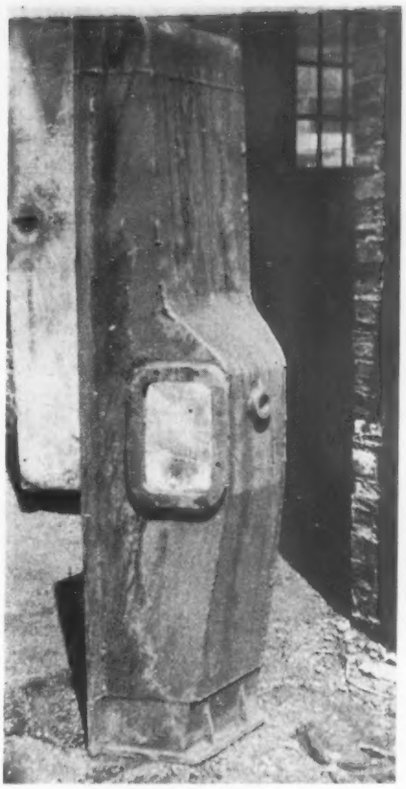


Fig. 3—Redesigned oil pan assembled by welding

As originally planned, the two steel castings for front and rear ends arrived from the foundry without preparatory machine work as pan design called for a planing operation after welding was completed. This was revised in the improved procedure and the two castings disk-ground prior to assembly to eliminate the planing operation and to allow the castings to be placed in the welding jig accurately.

As first laid out, the bottom sheet, being narrower in the center, had to be cut to shape on a nibbling machine and bent in four places on a bending brake. This required 1½ hours for each pan bottom as location of bends was quite critical since they must coincide with the pattern used in nibbling the right and left hand side sheets.

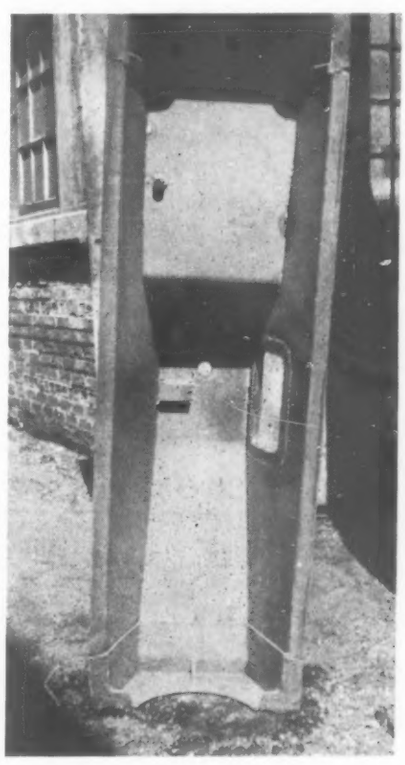
It immediately was apparent in the welding department that this could be made at a great saving of time if the pan was split up into plates which could be cut on a square shear, thus eliminating the expensive nibbling operation. This was done making the bottom sheet in three separate pieces. From front end to narrowest point is one piece. From rear end to narrowest point is a second piece. Extreme bottom forms a third. Thus all cutting is on a straight line which can be handled on a square shear. Bends need be made at only two places.

Originally the right and left hand side sheets were to be cut to size on a square shear and then nibbled to shape on the nibbling machine with the profound hope that they would fit the shape of the bottom when assembled. Since bending operation on the bottom sheet and nibbling operation on side sheets were not performed by the same operator, it was necessary to do the required fitting in the welding department. This procedure was changed so the stock could be cut to length and width on a square shear and then cut to final shape with a torch after the bottom sheet had been placed in the jig. In this manner all doubt as to probability of correct shape was eliminated.

The ledges referred to constitute the contact surface of the pan. Originally a planing operation was required to form a 15-degree angle on one side of each ledge to fit the slope of the side sheets. This planing operation required a half-hour of set-up time and a full hour to machine each pair of ledges. This ledge was 1½ inches in width before machining and 1¼ inches wide at contact surface after machining.

This was redesigned by changing the stock to 1¼ inches in width and eliminating entirely the machining operation with its attendant cost.

Fig. 4—Difficulty in matching parts for final assembly were eliminated



The 15-degree gap thus formed made an ideal Vee for welding.

No changes were necessary in the drain plug boss, baffle plate or clean-out plate boss.

Original plans called for planing the top of the pan to form a smooth surface for gaskets where it contacted the crank case. However, by a systematic welding procedure and use of a simple welding jig, need for this machining operation was completely eliminated. After pan leaves the welding department, it is ready for drilling and final assembly.

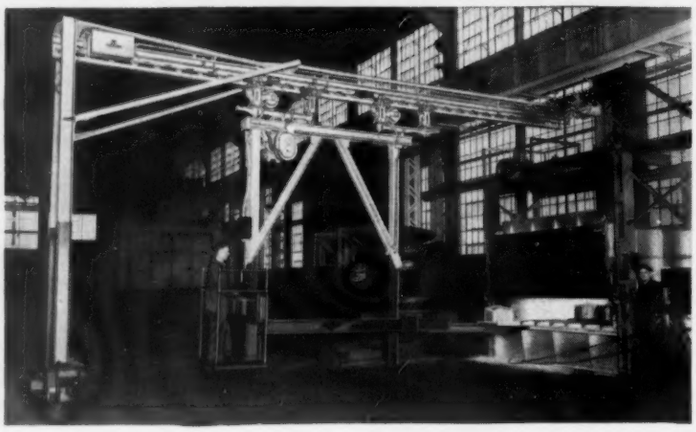
The special jig permits all welds to be made without removing the pan. With the jig elevated about 30 degrees, all welding can be done in a downhand position. By limiting length of weld to 6 inches, the stress is distributed throughout entire pan and not localized at any one point.

Cost of oil pan fabrication originally totaled $8.00. This compares with cost after the above changes were made of $4.40. This is a saving of $3.60, or 45 per cent of the original cost.

Thus by a thorough understanding of construction methods and possibilities of welded design, cost of making manifold and the oil pan was practically cut in half.

CLEVELAND TRAMRAIL

OVER HEAD HANDLING EQUIPMENT



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Improved Tempering

(*Concluded from Page* 46)

M for steel C in the diagram changes the picture considerably. It will be noted that fast quench No. 3 clears the nose of the S-curve by a wide margin and, in fact, slower rate No. 2 also clears comfortably. Slow cool No. 1 still does not pass and it means that such steels, either C or M, in sections so large that central portions cool no faster than this rate, are not austemperable. There is, therefore, a critical size for each steel above which austempering is not completely successful.

In the case of alloy steels, S-curves reveal that not only their nose times but total time periods required for transformation are increased. From an operating standpoint, steels with S-curve nose times just sufficient to permit austempering a given size are most desirable.

Considerable practical experience with the commercial equipment at Worcester along with other experiments has resulted in accumulation of much data of practical use in determining whether various steels are economically suited for austempering. Table I shows the highest austempered hardness obtainable for each steel by constant-temperature transformation at relatively low temperature levels. Since the method is used to obtain high hardness, it is not recommended for plain carbon steels of less than 0.60 per cent carbon, although 0.55 per cent carbon can be treated successfully. In Table I it will be noted that manganese and chromium have considerable effect.

Table II represents the results of mechanical property tests made on identical steels, one quenched and tempered and the other austempered. Table III shows similar comparisons of mechanical properties at several hardness levels.

Diagrams based upon experimental observation of a eutectoid steel at a series of constant temperature levels with products of transformation determined at these various temperatures show that a steel made austenitic and then held at a constant temperature level below the equilibrium temperature will require for the beginning and for the completion of its transformation definite time periods that are characteristic of the heated steel and of the constant temperature level at which it is held.

Structures obtained range from coarse pearlite near the top of such curves through fine pearlite and desirable bainite down to hard martensite at the bottom. It has been noted that constant temperatures resulting in bainite in the range between 350 and 750 degrees Fahr. are the most useful.

Carburizing Compound

(*Concluded from Page* 49)

terial in process is light, excess material is carried over to bin No. 7.

Where sudden cooling of the carburized parts is undesirable, two special racks and dump hoppers are provided as shown in Fig. 3 almost underneath the storage bin No. 7. Both these special racks and dump hoppers as well as bin No. 7 discharge directly into conveyor No. 3. Due to design of this conveyor, it will not be choked by these loads and always handles a full load if the material is available.

All these conveyors and elevators are 5 inches square in cross section and operate at a slow speed somewhere between 5 and 10 feet per minute. Conveyor housing is made of 3/16-inch steel plate, aluminum painted. The conveyors are equipped with alloy steel links or flights, detailed in Fig. 1. These are capable of withstanding a temperature of 1100 degrees Fahr. The life of the carbon, especially the charcoal, is exceptional in this installation because of the gentle handling it receives in these conveyors and because of their slow speed.

In the feeder units under bins Nos. 1 and 2, the method of transporting material is same as in link conveyor, that is—flights traveling through the conveyor slide it along the walls of the units. The conveyor flights are integral with the revolving disk, Fig. 2. When such a revolving disk is made to form the bottom of a circular silo or chute, material is taken from around the edges forming an accurate volumetric feeder with a strong tendency to prevent the bin from arching.

Operation of this conveyor system has made possible an important saving in carburizing material as mentioned above. The same system is applicable to many other types of handling problems, and is being developed to work more and more closely with processing operations such as the reconditioning work described here.

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Overload Control

(*Concluded from Page* 52)

at about 5 amperes. Control setting or trip point is usually set at 6 amperes, just above normal operating point. Of course the safety control ammeter is shunted at starting.

Sequence of events to place the control in operation is as follows: Main contactor is closed first. Next the start switch on the motor control is thrown to the "start" position, after which the starting contactor closes. Motor comes to speed.

Twenty seconds after the starting contactor is closed, the Wheelco Capacitrol lights a red light and the motor contactor is thrown to the "run" position. This affords ample opportunity for the motor to bring the flywheel of the press up to speed. The safety control instrument is connected to the motor contactor and to a trip solenoid which disengages the flywheel clutch. After the motor has come up to speed and the motor control has been thrown to the "run" position, this trip solenoid is energized and the ammeter shunting switch opened, placing the safety control circuit in operation.

In event the current taken by the motor goes above the trip value, the solenoid disengages the flywheel clutch and motor contactor drops out shutting down the press. In actual operation, the system is so fast that the press is stopped before the third piece can pile up.

This simple system appears to offer a reliable press safety control and no doubt will see wide application on many types of stamping, forming and blanking operations in the near future. Also the same principle may well be utilized on other application where a fast sensitive overload indicator or control may be desirable.

"Accurate Spotting" requires a
HAND-GEARED TROLLEY TYPE
A-E-CO LO-HED HOIST

When—1. The haul is short and load heavy or awkward. 2. The load must be accurately spotted, regardless of weight. 3. The load, because of its nature, must be carefully moved (chemicals, hot foundry ladles, etc.)—

The hand-geared trolley type A-E-CO Lo-Hed hoist—the one operated by a chain is the logical choice.

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- Low headroom—stacks materials higher than any other hoist.
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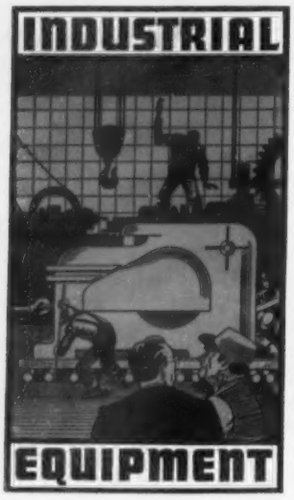
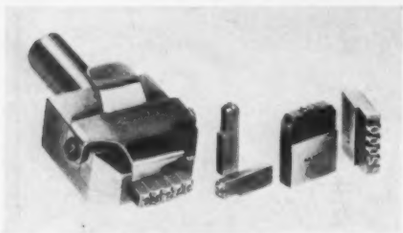


Type-Holder

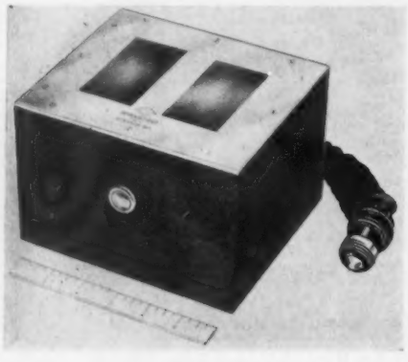
■ H. O. Bates, 251 North Broad street, Elizabeth, N. J. offers interchangeable type holder in either press style illustrated, hand style



with tapered shank to fit hand, or hammer style. Unit is made of one piece of shock-resisting alloy tool steel except for two hardened and welded steel blocks. Over-size stock is used for the steel type and a shoulder is milled out to center engraved letter or figure on remaining stock, thus strengthening center of body of piece of type where breakages would occur. Greater body gives larger surface to receive shock at end of type opposite the character.

Demagnetizer

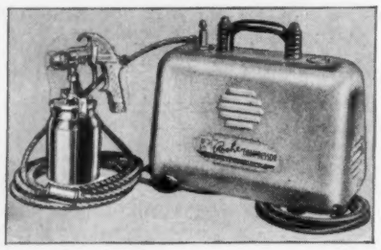
■ H. E. Dickerman Mfg. Co., Springfield, Mass., offers a demagnetizer for fast demagnetizing of tool steel alloys such as high-carbon high-chrome steels and molybdenum steels as well as regular run of steels. Rubber covered cord with plug is furnished for connecting to



25 to 60-cycle 110-volt alternating current supply. Case is ¾-inch thick solid mahogany. Price is $35.

Cooled Spraying Unit

■ Binks Mfg. Co., 3124 Carroll avenue, Chicago, announces New Roche line of portable spray equipment with forced draft cooling. Unit has two fans which set up a suction and blowing system within enclosed metal case. Placement of intake and exhaust vents permits entrance of



cooling air and does not allow this air to escape until it has passed completely around all parts of unit. Thus a constant temperature is assured. Unit has heavy-gage steel case and a single handle on top. Weight is about 40 pounds.

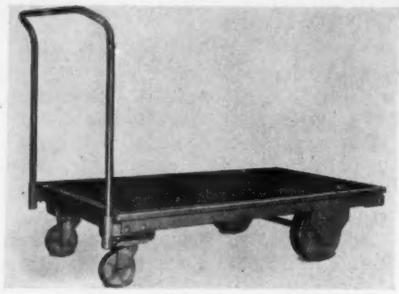
Electric Aircraft Motor

■ Dumore Co., Racine, Wisc., has developed type El-Y direct current electric aircraft motor rated 12 or 24 volts, intermittent duty, 1/20-1/16

horsepower at 200-1200 revolutions per minute. Motor is totally enclosed and weighs 3 pounds. All screws on housing are safety-wired to withstand vibration. Gearing used is of the spur type. Motor can be wound for 115 volts for inline drives.

Convertible Truck

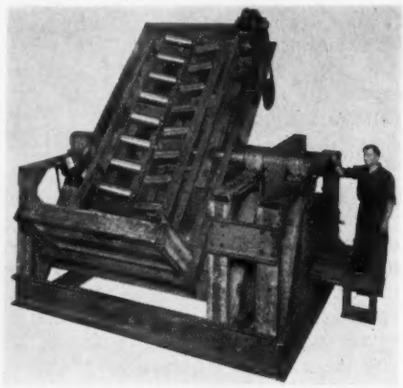
■ The new floor truck designed by Barrett-Cravens Co., 3255 West Thirtieth street, Chicago, has a hardwood deck bound with steel angles to prevent splintering and cracking at the edges. Semi-steel wheels are of wider than usual width to provide greater bearing area and protect floors. An additional feature is that the brackets supporting the push bar can be readily removed to permit installation of a box, rack or



shelf-type substructure. The truck is ruggedly reinforced and the front wheels are mounted to provide easy turning and withstand overloading.

Tilts Coils from Horizontal to Vertical

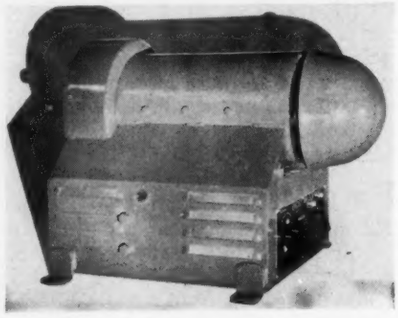
■ Logan Conveyor Co., Louisville, Ky., has built an Up-Ender for tilting coils of sheet metal from the horizontal to the vertical position. Coils on a mandrel are placed on the carriage in the horizontal posi-



tion by a ram truck. When so loading, gate or stop at the bottom is lowered down out of the way electrically and coil is placed on rollers. The gate then is lifted, mandrel withdrawn. Roller carriage next is moved to place the coil directly against the gate, which will support coil when in vertical position.

Belt-Drive Welder

■ A small welder rated at 200 amperes known as Shield-Arc Junior for use with engine or electric motor drive has been developed by Lincoln Electric Co., 12818 Coit road, Cleveland. Its current range, welding duty, 30-volt arc, is 60 to 250



Advertisement

COPPER ALLOY BULLETIN

Reporting News and Technical Developments of Copper and Copper-Base Alloys

SEPTEMBER "Bridgeport" BRASS CO. 1939

SPECTROGRAPHIC ANALYSIS INVALUABLE ADJUNCT AS LABORATORY ROUTINE CHECK

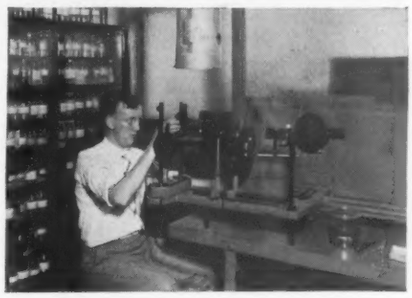
Comparatively New Method Helps Bridgeport Determine Chemical Compositions Quickly, Accurately

Spectra of all sorts of alloys are produced in Bridgeport's laboratory today by packing weighed or measured quantities of metallic chips, salts, or solutions into small craters made in carbon electrodes, and photographing the spectra through electric arc spectrographs.

The spectra produced by the various chemical elements with this method of excitation are distinctly different from one another, as indicated by the spectrogram illustrated here. This shows lead, zinc, copper, and three samples of high brass containing 0.17, 0.07, and 0.004% lead. The spectrogram of each element is made up of a series of parallel lines which are characteristic of that particular element. When two or more elements are mixed or fused, each element in the compound or alloy produces a spectrogram characteristic of itself. The spectrogram of the alloy or compound is therefore a composite made up of two or more spectrograms superimposed upon each other.

Checks Purity of all Metals

By studying these it is possible to check the purity of all virgin metals and alloys, compare satisfactory with unsatisfactory samples, examine defects for segregation, sort out mixed lots of metal, examine precipitates, water pipe deposits and corrosion products, determine the impurity content of plating solutions—and make numerous



The spectrograph in the metallurgical laboratories of Bridgeport Brass is in almost continual use—turning out upwards of 500 spectra determinations per week.

preliminary, qualitative, spectrochemical analyses. In the last instance alone, the spectrograph is invaluable since a qualitative spectrographic examination together with an estimation of the major and minor constituents may yield all the information necessary. If a chemical analysis is desired, all the laborious qualitative chemical work is cut from hours or days—to a few minutes or, at the most, several hours. As the evidence is positive, it can, by comparative methods, be made quantitative.

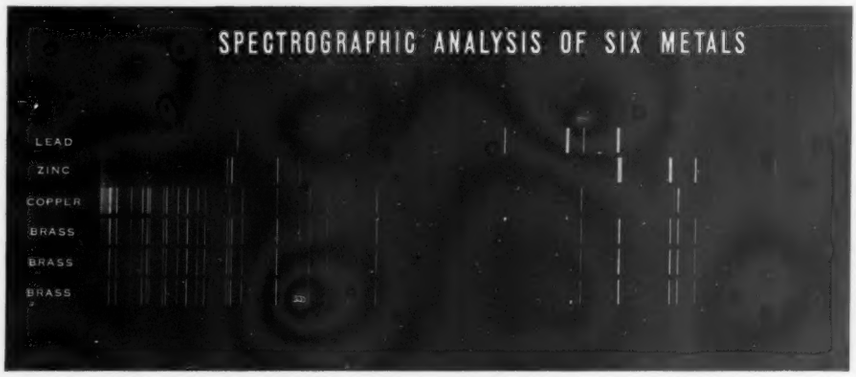
Dates back to 17th Century

It is interesting to note that the basis for all modern spectrographic analyses dates back to Sir Isaac Newton's discovery that a beam of white light from the sun could be dispersed by a prism to give a spectrum of seven principal colors.

It was not until the nineteenth century, however, that Hershel, Wheatstone, Angstrom and others began to recognize that chemical substances could be identified by spectroscopic analysis. Bunsen and Kirchhoff in 1860 in a paper entitled "Chemical Analysis by Means of Spectral Observations," showed that the spectroscopic method of analysis was really practical. They recorded the visible spectra obtained from a number of metallic salts made luminous in a simple Bunsen flame. During and after this period it was learned that the chemical elements change spectra with the type of light source—giving flame, arc, spark, and other types of spectra. This tended to hinder the development of the spectral method of chemical analysis. Yet, in spite of these difficulties, a number of enthusiasts continued to use this method.

Around 1913, Burns at the National Bureau of Standards, set up the first spectrochemical service in the Americas. Slowly chemists and physicists throughout the

(Continued on Following Page, Column 2)



Typical spectrogram, illustrates the spectrums (from top to bottom) of lead, zinc, copper, and three of high brass containing 0.17% lead, 0.07% lead and 0.004% lead, respectively.

DURONZE III ROD IDEAL METAL FOR VALVE PARTS

Duronze* III rod has been found to be extremely suitable for the manufacture of valve stems. It is harder and more resistant to corrosion than other metals commonly used for this purpose. Typical application is in the dual stoker valve illustrated, made by Edward O'Malley Valve Co., and used by a number of large railroads.

Another advantage of Duronze III in valve stems is its comparatively low coefficient of friction. The alloy is equally adaptable to the production of cast valve bodies.

COPPER ALLOY BULLETIN

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. Further information on any of these items may be obtained by writing the Bridgeport Brass Company, which will gladly refer readers to the manufacturer or other source.

Phosphor bronze washers are now being produced in sizes as small as .069 inch outside diameter and .005 inch thick, it is reported. The manufacturer uses equipment especially designed for very small stamped products. It is said that one-quarter million of the washers weigh less than a pound.

A cleaning material is employed in solution with a high-density negative current to clean metal parts prior to plating. It is reported that the material will remove carbonized smut from polished copper and will take off grease, oil, or dirt that may have collected on work parts during production operations and storage periods. It is said that no mechanical scrubbing or hand wiping is required.

A tube expander of a taper-roller design avoids ridging the tube where rolling overlaps in a two-operation job, according to the manufacturer. It is designed for handling brass and copper tubes in condensers and heat exchangers. Available in a wide range of sizes.

Silver brazing alloys have been successfully applied to the assembly of current conductor parts made from copper bars ¼ inch thick and 6 inches wide, which are secured by a brazing to a copper casting, it is reported by the makers of the brazing alloys.

Bronze pushers are said to retain the proper spring tension necessary for correct feeding. The bronze is also said to aid in eliminating the scratching which is caused by friction when a steel pusher is used with steel stock. Pushers have a long, flat surface grip.

Die-casting machines for the production of brass alloy castings are said to provide pressures up to 16,000 pounds per square inch. An oversized oil pump is said to provide ample pressure at all times. Equipment includes heating unit, pyrometer, pump and motor, shut-off valves, and counter.

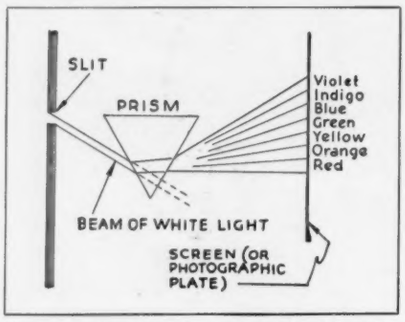
Metallographic specimens can be prepared by a technique which almost completely eliminates the human element, according to the manufacturer of a new metallographic polishing machine. Features claimed for the equipment are standardization of polishing technique by prepared solutions; uniform flatness of finished specimens; low operating speeds to reduce the flow of metal; and a substantial saving in polishing time.

An X-ray diffraction unit is said to be smaller and more versatile than previous equipment of this type. It is provided with cameras and other accessory devices which fit it for application to problems of metallurgical analysis and testing.

SPECTROGRAPHIC ANALYSIS

(Continued from Preceding Page, Column 3)

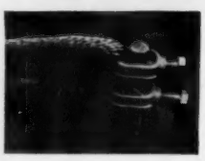
world began to realize what could be done with a spectrograph. During the last decade the development of this has progressed very rapidly. Gravimetric and colorimetric chemical methods have been extended and refined, some gravimetric methods displaced in routine control work, and numerous new fields have been opened up.



Illustrating the principle of Newton's original discovery—defracting a beam of white light into the seven principal colors of the spectrum.

Copper Protects Trees From Lightning and Squirrels

Oddities in the application of copper are its use to protect trees from such varied



Upper left shows tree protected by braided copper lightning rod. *Upper right* shows copper band for protecting nut tree against marauding squirrels. *Inset* shows attachment to ground clamp.

ravages as those of lightning and squirrels. Lightning protection, as installed by The F. A. Bartlett Tree Expert Company, is an adaptation of the familiar copper ground connections so widely used on buildings and electrical equipment. General practice is to install copper-clad or woven copper cable from top of tree to ground, where it is buried in a trench and connected to a metal object slightly beyond the branch spread.

Squirrels are baffled in their efforts to climb trees by bands made of thin copper sheets. Smooth surface of the copper affords no grip for climbing, and in summer the heat absorbed by the copper is an added deterrent.

ALLOYS OF COPPER

This is the fourth of a series of articles on the properties and applications of the copper alloys, and concludes the subject of Gilding Metal.

GILDING METAL (Concluded)

As pointed out in the August issue, the most important applications of Gilding Metal are in the manufacture of small arms ammunition and primer caps, and of enameled jewelry.

For many other uses, alloys of slightly higher zinc content are available which have more favorable combinations of properties than does Gilding Metal and which may be used for the same purpose. Many of the higher copper content alloys are used because of color characteristics which are desirable, but Gilding Metal is not used to as great an extent for this purpose. Because of these combinations of properties, there is less Gilding Metal used generally than any of the higher copper content alloys which are at all comparable to it.

Properties of Gilding Metal

Analysis	95% Copper—5% Zinc
Electrical Conductivity, %, I. A. C. S.	57%
Electrical Resistance, Ohms/circ. mil foot	18.195
Thermal Conductivity, % Copper	63%
Thermal Conductivity, Cal./sq. cm./cm./sec./°C.	0.579
Coefficient of Expansion /°Fahr	0.0000096 (77° to 212° F.)
Density, Grams/cu. cm.	8.866
Density, Lbs./cu. in.	.320
Tensile Strength, Lbs./sq. in.	
Annealed Sheet	32,000–38,000
Hard Sheet	50,000–59,000
Elongation, % in 2 inches	
Annealed Sheet	40–50%
Hard Sheet	3–10%

Fabricators desiring information on Gilding Metal or any other copper alloy in specific uses are invited to discuss their problems with Bridgeport Brass Company.

PRODUCTS OF THE BRIDGEPORT BRASS COMPANY

Executive Offices: BRIDGEPORT, CONN.—Branch Offices and Warehouses in Principal Cities

SHEETS, ROLLS, STRIPS—*Brass, bronze, copper, Duronze,** for stamping, deep drawing, forming and spinning.

CONDENSER, HEAT EXCHANGER, SUGAR TUBES—For steam surface condensers, heat exchangers; oil refineries, and process industries.

PHONO-ELECTRIC* ALLOYS—High-strength bronze trolley, messenger wire and cable.

WELDING ROD—For repairing cast iron and steel, fabricating silicon bronze tanks.

LEDRITE* ROD—For making automatic screw machine products.

"Bridgeport" BRASS CO. *Established 1865*

COPPER WATER TUBE AND FITTINGS—For plumbing, heating, underground piping.

DURONZE ALLOYS—High-strength silicon bronzes for corrosion-resistant connectors, marine hardware; *hot rolled sheets* for tanks, boilers, heaters, flues, ducts, flashings.

BRASS, BRONZE, DURONZE WIRE—For cap and machine screws, wood screws, rivets, bolts, nuts.

FABRICATING SERVICE DEPT.—Engineering staff, special equipment for making parts or complete items.

BRASS AND COPPER PIPE—"Plumrite"* for plumbing, underground and industrial services.

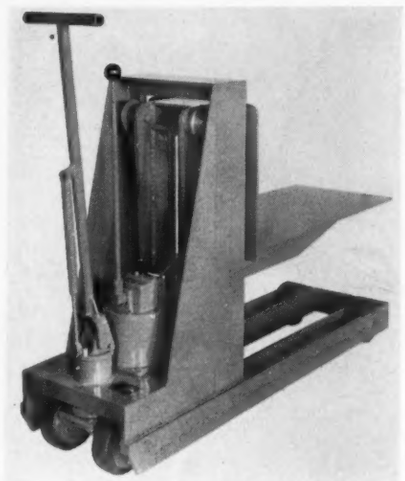
*Trade-name.

BRIDGEPORT BRASS

amperes. Dual continuous control system of voltage and current control permits independent adjustment of voltage and current, and gives complete and separate control of arc heat and arc penetration. Equipped with Class B (noninflammable) insulation, welder can be operated with relatively large size electrodes at high average current without danger of burning out. Generator is single operator, variable voltage type with laminated pole pieces. Uniform welding current of high responsiveness is produced for speedy welding of all metals and alloys, light gage and heavy materials. Unit is 29⅝ inches long over pulley, 18 inches high with base 15½ x 19⅝ inches. Net weight is 320 pounds.

Truck Has Lifting Table

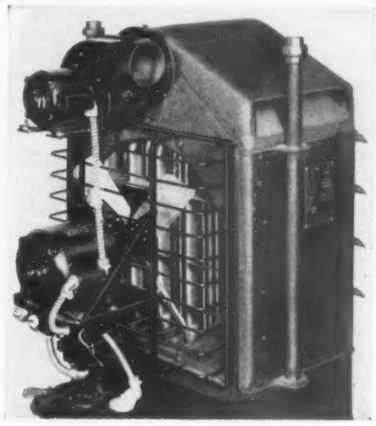
■ Lyon Iron Works, Greene, N. Y., offers cantilever type truck with hydraulic elevating table for maintaining skid loads of materials or parts



at convenient heights for machine operators or assemblers. Toggle lever type trucks are available with or without winch for handling dies or rolls in and out of presses or rolling machines and for handling sheets to maintain convenient heights of feeding machines. Elevation is through hydraulic rams, powered by a hand operated single or two-speed hydraulic pump. Standard sizes of cantilever type range from 350 to 5000 pounds. Platform widths are 18 to 36 inches and lengths 24 to 60 inches. Lowered height from 3¼ to 18 inches and elevated height as desired may be had.

Gas-Fired Unit Heater

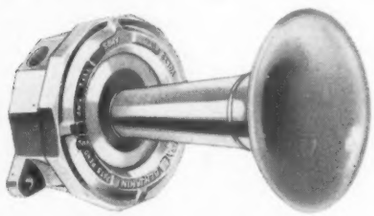
■ Five gas-fired unit heaters ranging in capacities from 85,000 to 200,000 B.t.u. per hour have been announced by Automatic Gas-Steam Radiator Co., 490 Brushton avenue, Pittsburgh. These heaters are equipped with automatic flues for venting products of combustion from interior of building and employ natural or manufactured gas for fuel. They are applicable for many types of buildings and manufacturing plants of all kinds. The automatic flue consists of a motor and blower connected in such a way that when the heater starts to work, the flue automatically carries the products of combustion through pipe and wall to the outside. The assembly includes a safety pilot which turns off the gas as the pilot goes out or burns too low to insure ignition. In addition to heating, these



heaters may be used for other purposes such as ventilating, cooling and drying. The heater is suspended from the ceiling, out of the way.

Howler Plugs to Socket

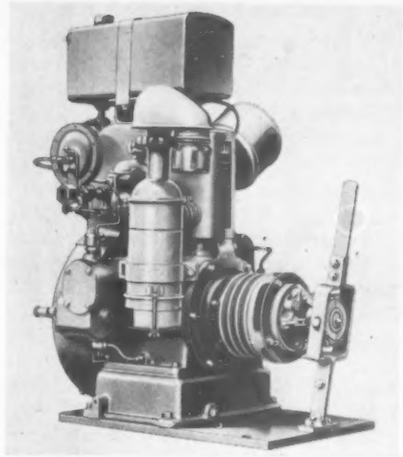
■ Greater sound penetration has been secured in the new industrial signal howlers made by Benjamin Electric Mfg. Co., Des Plaines, Ill., by increasing the volume by 100 per cent and providing a new distinctive tone that gives signal greater audibility. Howler may be detached



from its base by turning a threaded ring, which seals against dust and moisture. Howlers are interchangeable and are plugged into base sockets permitting line replacements with a minimum of service interruption. Separable construction also facilitates inspection and service work.

One-Cylinder Engine

■ The single-cylinder, 4-cycle, 5.5 horsepower engine of Caterpillar Tractor Co., Peoria, Ill., is claimed to be especially well suited for pumping jobs where horsepower requirements are low. With no water to freeze or boil away, and with an unusually large lubricating oil sump, the new 400G engine can run for



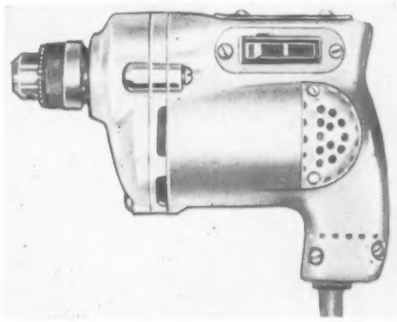
long periods of time without attention. It is equipped with a Caterpillar clutch and has a built-in governor. Bore and stroke are 3⅝ x 4 inches. Full load speed range is 800 to 1800 revolutions per minute and speed regulation with standard 1600-revolution-per-minute continuous-load governor setting is 7.8 per cent. Engine is started manually and uses either gas or gasoline.

Transmission Belt

■ Hewitt Rubber Corp., 240 Kensington avenue, Buffalo, announces a neoprene friction surface transmission belt with raw edge construction. Conservo red covered air hose, the same as Duroil except it has a red cover, has also been added to the line.

Hand Drill

■ Jas. Clark, Jr., Electric Co., Louisville, Ky., introduces Ace UD4-2 ¼-inch drill with all rotating parts mounted in precision ball bearings. Spindle, spindle gear and armature pinion are oil hardened. Frame, gear plate, and gear head are cast from a special aluminum alloy. Motor is air cooled by over-sized fan with improved type slotted air ducts. Standard equipment includes 15 feet of three-conductor flexible rubber attachment cord with unbreakable rubber plug, three jaw chuck and key, thumb control switch and universal motor operating on either alternating or direct current.



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been able to swing these developments unassisted before. It had no chance at all before the challenge of undertakings which became increasingly costly with every rise in population density and land values.

So the rest of our industrial development was like the development of streamlined trains—far ahead of that of the rights of way over which they must travel. Now we can build trains to operate at 100 to 120 miles per hour with complete safety. But the nation and particularly the east is saddled with the rights of way of a bygone century — rights of way which follow the contour lines — rights of way on which, with few exceptions, it is not safe to run any kind of train over 60 miles an hour. Here in miniature is a picture of why our whole industrial mechanism capable of greater things must also be operated at "half throttle."

Further Evolution in Finance

Therefore it develops that in addition to tax adjustment, improved labor relations, removal of government competition and the like, we need further evolution in the financial system and enabling arrangements by which private enterprise can proceed with the framework of a higher level of civilization.

Cartelization of any other form of increased corporate powers and monopoly certainly are not the American answer. Yet if this is to be denied corporations, there is no source of increased financial and enabling powers except through public agencies.

Can we then, develop a constructive public cooperation and implementation which will not destroy but strengthen an order of private enterprise?

Within these specifications, there are only three general types of financial co-operation which public agencies can render. First is subsidy, which on any great national scale now seems to be out of the question. "Why," the voter asks, "should private investors receive returns on risks which they do not take?" It is dubious if there is any effective answer.

The second possibility is public loans such as extended by the RFC. The difficulty here is that a "prior lien" position for government is the shortest route to government ownership. Applied on any large scale to building the framework of a future civilization, this almost certainly will lead to state capitalism. That in fact is the crucial defect of any broad government lending policy.

The third possibility is an "equity type" of investment by government on a basis which neither gives government a prior lien position nor hands private investors the returns on risks they do not take as under subsidy. If such a position is taken in the form of a non-voting common stock, there need be no threat of government ownership. Instead of competing with an already existing plethora of private funds in banks and insurance companies seeking any reasonable secured investment, public money may bolster up the deficient reservoir of risk capital. For surveillance of its help to private enterprise, government has ample recourse in its existing commissions like the ICC and through legislation already on the books, such as the Chandler Act.

At least it can be said that America has as yet paid comparatively little attention to this third alternative. Having outrun subsidy, having become thoroughly enlightened as to the dangers of a loan policy, we now may be coming to an era of evolution in this third form of cooperation between government and business in which government does not threaten to destroy and business does not get undue handouts and opportunities to abuse.

Redirect Public Spending

This may come about, not through an increase in public spending, but through a redirection of enormous sums now either being fritted away on less useful works or directed into competitive projects which depress private enterprise, hold down the total national income and impair the tax base. Whether or not this may lead to a reduction in public spending to 1926 levels, is hard to say. But when all public spending—federal, state and local—is taken together, such a reduction would be far less than most people think. For the process of the last 10 years has been more a transference of spending from local to federal agencies than an increase in total spending. Far more important is the necessity to regenerate the character of public spending, which has been successively deteriorating for the last 10 years.

This regenerating process is inherent in the type of government attitude and help considered here. It is the logical *first step* in attacking a problem in public waste and relief expenditures which cannot be dropped forthwith. And it has potentialities for usefulness and value to the people as a whole. It may have been the crucial missing link in the 1920's.

Added to a policy of tax revision, equitable labor negotiation and reduction in building costs, a gradual development of public help along these lines may be the answer to the underlying long-term causes of our unprecedented slowdown and the key to the next "double" in the progress of America.

•

Hopper-Type Bolt and Nut Container Has Hinged Lid

■ A unique hopper-type metal container has been developed by J. W. Simmons, Atlas Bolt & Screw Co., Cleveland. It features a hinged lid which permits access regardless of how many may be stacked. Even smallest boxes have great compressive strength due to rolled bead at front and back of the straight sides. They withstand 300 pounds without distortion, so units may be stacked as high as desired.

Hopper door has lips which fit into slots of container to form hinge, the usual hinge wire not being necessary. Shape of hopper sides prevents door from opening sufficiently to

spill contents. Outside surfaces are lithographed, inside are lacquered. In packing containers for shipment, damage to lithographed surfaces is prevented by encasing boxes in individual corrugated paper sleeves fully protecting surfaces.

A complete line of Atlas automotive bolts, nuts, cotterpins, etc., already is being marketed in the Hope-Seal boxes, and shortly the complete hardware line of the company will be available in these boxes. In addition, licenses already have been granted to manufacturers of tire repair kits, fishing tackle, brake lining rivet sets and others for marketing their products in these new containers. Other licenses are being issued rapidly.

Another feature which makes the new container attractive to automotive parts manufacturers, etc., is that these boxes are readily mounted in groups on a simple stamped sheet metal plate which can be hung on the wall, thus providing convenient access to contents of a number of boxes. Lips are formed in the wall plate to fit the rolled container back. Containers simply are slid from the side into the lips which grip it at top and bottom.

Steel Activity at New High for Year

Miscellaneous Buying Main Market Support; Railroads Active

MARKET IN TABLOID ★

Demand
Sustained, with increase indicated.

Prices
Firm on practically all products.

Production
Rises ½-point to 64 per cent.

■ SHOWING no sign of the usual summer lull and approach of Labor day steel production continued its rise, advancing ½-point to 64 per cent, with indications of further increase in early September.

Despite conditions in Europe no definite effects on steel buying in this country are apparent. A large part of current orders are from miscellaneous sources. Automotive steel purchases have been held back somewhat later than expected.

Extent to which the industry is exceeding activity of last year is shown in the American Iron and Steel institute report on pig iron production for first half. Total output of pig iron and ferroalloys in that period was 12,656,942 gross tons, compared with 8,104,021 tons in the first six months last year, an increase of 56 per cent.

Railroads in Market for Freight Cars; Automotive Buying Increases Slowly

Railroad awards are larger than for some time. Chesapeake & Ohio has closed on 2500 freight cars and is inquiring for 2500 tons of steel, mostly plates, for a car repair program. Delaware & Hudson has asked bids on 500 to 1000 hoppers. New York Central is reported about to award 2000 cars to its subsidiary, Merchants' Dispatch Inc., Rochester, N. Y. Pittsburgh Railways Co. has placed 100 streamlined street cars. Chicago & North Western's inquiry for 800 cars has not been closed. Chicago Rapid Transit Co. is inquiring for 1000 elevated-subway cars of lightweight high-tensile steel construction.

Automobile production is swinging into its stride as various producers start new model assemblies. Despite the fact Ford was closed, production last week totaled 25,240 units compared with 18,365 in the preceding week. General Motors increased from 2600 to 7200, Chrysler from 6800 to 7025 and all others from 8515 to 11,015. In the corresponding week last year output was 22,165 units.

Steel and iron imports in July were 27,516 tons, compared with 30,050 tons in June. Scrap imports showed a slight rise, 3335 tons against 2537 in June. Imports for seven months at 189,707 tons are well above 131,909 tons in the same period in 1938. Scrap imports for seven months were 18,138 tons; in the same period last year 1804 tons.

August pig iron production was 2,627,542 gross tons, highest since October, 1937. This was 316,506 tons more than the 2,356,036 tons made in July, a gain of 13.5 per cent. August daily rate was 86,211 tons, compared with 76,001 tons in July. Eight months production this year totaled 17,549,709 tons, compared with 10,639,688 tons in the corresponding months last year, a gain of 65 per cent. Active stacks increased from 130 to 139.

Pig Iron More Active, Foundries Busier: Scrap Prices Strong, Some Grades Scarce

Pig iron shipments are increasing, partly on account of insistence by producers that low-priced tonnage be taken at once, and partly to avoid shortage in case the European situation develops unexpected demand. Foundries are busier, as indicated by larger coke specifications. Fourth quarter prices have not been set but some buyers are inquiring for that delivery.

Steelmaking scrap is strong, though prices are not materially changed, the composite remaining at $15.50. Considerable scarcity exists and buyers are paying premiums for export in some instances. Despite increased steel production relatively little tonnage buying is being done. Iron and steel and finished steel composites are unchanged at $35.98 and $55.60, respectively.

Continuing its rise, the steelmaking rate advanced ½-point last week, to 64 per cent, a new high for the year. Increases were small and operations were unchanged in six districts. Pittsburgh was up 3 points to 59 per cent, Detroit 8 points to 90, Youngstown 1 point to 56, St. Louis 6.5 points to 63.5, and Cincinnati 3 points to 66. Chicago dropped 2 points to 54 per cent. Unchanged rates prevailed at Wheeling 86, Cleveland 80, Buffalo 60.5, Birmingham 75, New England 70 and Eastern Pennsylvania 44.

COMPOSITE MARKET AVERAGES

	Sept. 2	Aug. 26	Aug. 19	One Month Ago Aug., 1939	Three Months Ago June, 1939	One Year Ago Sept., 1938	Five Years Ago Sept., 1934
Iron and Steel	$35.98	$35.98	$35.97	$35.95	$35.69	$36.48	$32.15
Finished Steel	55.60	55.60	55.60	55.60	55.70	57.20	54.00
Steelworks Scrap..	15.50	15.50	15.42	15.30	14.49	14.23	9.45

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Sept. 2, 1939	Aug. 1939	June 1939	Sept. 1938
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.25c
Steel bars, Chicago	2.15	2.15	2.15	2.25
Steel bars, Philadelphia	2.47	2.47	2.47	2.57
Iron bars, Terre Haute, Ind.	2.05	2.05	2.05	2.15
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.00	2.00	2.00	2.15
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.20
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.00	2.00	2.00	2.15
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.20
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.35
Wire nails, Pittsburgh	2.45	2.40	2.45	2.45

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	43.00	43.00	43.00	43.00

Pig Iron

	Sept. 2, 1939	Aug. 1939	June 1939	Sept. 1938
Bessemer, del. Pittsburgh	$22.34	$22.34	$22.34	$21.34
Basic, Valley	20.50	20.50	20.50	19.50
Basic, eastern, del. Philadelphia	22.34	22.34	22.34	21.34
No. 2 foundry, Pittsburgh	22.21	22.21	22.21	21.21
No. 2, foundry, Chicago	21.00	21.00	21.00	20.00
Southern No. 2, Birmingham	17.38	17.38	17.38	16.38
Southern No. 2, del. Cincinnati	20.89	20.89	20.89	19.89
No. 2X, del. Phila. (differ. av.)	23.215	23.215	23.215	22.215
Malleable, Valley	21.00	21.00	21.00	20.00
Malleable, Chicago	21.00	21.00	21.00	20.00
Lake Sup., charcoal, del. Chicago	28.34	28.34	28.34	28.34
Gray forge, del. Pittsburgh	21.17	21.17	21.17	20.17
Ferromanganese, del. Pittsburgh	85.33	85.33	85.33	97.77

Scrap

Heavy melting steel, Pittsburgh	$16.25	$16.15	$15.00	$15.25
Heavy melt. steel, No. 2, E. Pa.	14.75	14.375	13.125	12.75
Heavy melting steel, Chicago	13.75	13.75	13.55	13.60
Rails for rolling, Chicago	17.75	17.75	17.75	17.75
Railroad steel specialties, Chicago	15.50	15.50	15.50	16.60

Coke

Connellsville, furnace, ovens	$3.75	$3.75	$3.75	$3.75
Connellsville, foundry, ovens	5.00	5.00	5.00	5.00
Chicago, by-product fdry., del.	10.50	10.50	10.50	10.50

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.00c
Chicago, Gary	2.00c
Cleveland	2.00c
Detroit, del.	2.10c
Buffalo	2.00c
Sparrows Point, Md.	2.00c
New York, del.	2.24c
Philadelphia, del.	2.17c
Granite City, Ill.	2.10c
Middletown, O.	2.00c
Youngstown, O.	2.00c
Birmingham	2.00c
Pacific Coast points	2.50c

Cold Rolled

Pittsburgh	3.05c
Chicago, Gary	3.05c
Buffalo	3.05c
Cleveland	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.37c
New York, del.	3.39c
Granite City, Ill.	3.15c
Middletown, O.	3.05c
Youngstown, O.	3.05c
Pacific Coast points	3.65c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points	4.00c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.80c
Pacific Coast	4.50c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	24.00	35.00
Cold stp.	22.00	22.50	32.00	52.00

Steel Plate

Pittsburgh	2.10c
New York, del.	2.19-2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.42c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, Pa.	2.10c
Sparrows Point, Md.	2.10c
Claymont, Del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Pittsburgh	3.35c
Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast points	2.70c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.00
Granite City, Ill.	5.10

Mfg. Terne Plate (base box)

Pittsburgh, Gary, Chicago	$4.30
Granite City, Ill.	4.40

Bars

Soft Steel

(*Base, 20 tons or over*)

Pittsburgh	2.15c
Chicago or Gary	2.15c
Duluth	2.25c
Birmingham	2.15c
Cleveland	2.15c
Buffalo	2.15c
Detroit, delivered	2.25c
Philadelphia, del.	2.47c
Boston, delivered	2.52c
New York, del.	2.49c
Gulf ports	2.50c
Pacific Coast points	2.75c

Rail Steel

(*Base, 15 tons or over*)

Pittsburgh	2.00c
Chicago or Gary	2.00c
Detroit, delivered	2.10c
Cleveland	2.00c

Buffalo	2.00c
Birmingham	2.00c
Gulf ports	2.35c
Pacific Coast points	2.60c

Iron

Chicago, Terre Haute	2.05c
Philadelphia	2.37c
Pittsburgh, refined	3.50-8.00c

Reinforcing

*New Billet Bars, Base**

Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt., Pitts.	1.90c
Gulf ports	2.25c
Pacific Coast ports	2.35c

*Rail Steel Bars, Base**

Pittsburgh, Gary Chicago, Buffalo, Cleveland, Birm.	1.80c
Gulf ports	2.15c
Pacific Coast ports	2.25c

**Base prices 20 cents less per 100 lbs. on billet bars, 15 cents less on rail steel, in lots of 20 tons or over of one size, in lengths of 30 feet or over, for shipment at one time to one destination.*

Wire Products

Pitts-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard wire nails	$2.40
Cement coated nails	$2.40
(Per pound)	
Polished fence staples	2.40c
Galv. barbed wire, standard 12½ gage two-point hog, 80-rod spool $2.74; two-point cattle, 80-rod spool	3.2.58
Annealed fence wire	2.90c
Galv. fence wire	3.30c
Woven wire fencing (base C. L. column)	57.00
Single loop bale tie (base C. L. column)	56.00

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)

Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c

Worcester, Mass., $2 higher on bright basic and spring wire.

Cut Nails

Carloads, Pittsburgh $3.60

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.65c	3.35c
Chicago	2.65c	3.35c
Gary, Ind.	2.65c	3.35c
Detroit	2.70c	*3.45c
Cleveland	2.65c	3.35c
Buffalo	2.65c	3.35c

* Delivered.

Alloy Bars (Hot)

(Base, 3 tons or over)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.70c

Detroit, delivered 2.80c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.55

4600 0.20 to 0.30 Mo. 1.50-2.00 Ni. 1.10

5100 0.80-1.10 Cr. 0.45

5100 Cr. spring flats 0.15

6100 bars 1.20

6100 spring flats 0.85

Cr. N., Van. 1.50

Carbon Van. 0.85

9200 spring flats 0.15

9200 spring rounds, squares 0.40

Electric furnace up 50 cents.

Strip and Hoops

(Base, hot strip, 1 ton or over; cold, 3 tons or over)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.00c
Detroit, del.	2.10c
Philadelphia, del.	2.32c
New York, del.	2.36c
Cooperage hoop, Youngs., Pitts.; Chicago, Birm.	2.10c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.80c
Chicago	2.90c
Detroit, del.	2.90c
Worcester, Mass.	3.00c

Carbon	Cleve., Pitts.
0.26—0.50	2.80c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass. $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	2.95c
Detroit, del.	3.05c
Worcester, Mass.	3.95c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00

Cents per pound

Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.

Carriage and Machine

½ x 6 and smaller	68.5 off
Do. larger, to 1-in.	66 off
Do. 1¼ and larger	64 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts attached 72.5 off; in packages with nuts separate 72.5-12½ off; bulk 84 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts	60 off
Elevator bolts	60 off
Plow bolts	68.5 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
6-inch and less	67	70
⅞-1-inch	64	65
1⅛ and larger	62	62

Hexagon Cap Screws

Upset, 1-in., smaller ..... 67.5 off

Square Head Set Screws

Upset, 1-in., smaller	75.0 off
Headless set screws	70.0 off

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.75c

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago	3.40c
⅞-inch and smaller, 11 and 12	63⅛ 54
Pitts., Chi., Cleve.	65-10 off
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75	off

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
⅛	63½	54
¼	66½	58
1—3	68½	60½

Iron

¼	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½	
2, lap weld	60	
2½ to 3, lap weld	63	
3½ to 6, lap weld	65	
7 and 8, lap weld	64	
10-inch lap weld	63½	
12-inch, lap weld	62½	

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½"O.D.	13	$ 9.72	$23.71
1¾"O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2¼"O.D.	13	13.79	21.68
2¼"O.D.	12	15.16	.....
2½"O.D.	12	16.58	26.57
2¾"O.D.	12	17.54	29.00
3" O.D.	12	18.35	31.36
3½"O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
6" O.D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1 "O.D.	13	$ 7.82	$ 9.01
1¼"O.D.	13	9.26	10.67
1½"O.D.	13	10.23	11.79
1¾"O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2¼"O.D.	13	14.54	16.76
2¼"O.D.	12	16.01	18.45
2½"O.D.	12	17.54	20.21
2¾"O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3½"O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4½"O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$42.00-43.00
4-in., Birmingham	45.00-46.00
4-in., Chicago	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.	49.00

Class A Pipe $3 over Class B

Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm.	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅜-inch incl.	43.00
Do., over ⅜ to ⅝-in.incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Youngstown, Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.75
Connellsville, fdry.	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Terre Haute, del.	10.00
Milwaukee, ovens	10.50
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.00
Indianapolis, del.	10.00
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del.	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	5.75c

Per ton, bulk, f.o.b. port

Sulphate of ammonia	$28.00

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$22.00	$22.50	$21.50	$23.00
Birdsboro, Pa.	22.00	22.50	21.50	23.00
Birmingham, Ala.‡	17.38	.....	16.38	22.00
Buffalo	21.00	21.50	20.00	22.00
Chicago	21.00	21.00	20.50	21.50
Cleveland	21.00	21.00	20.50	21.50
Detroit	21.00	21.00	20.50	21.50
Duluth	21.50	21.50	.....	22.00
Erie, Pa.	21.00	21.50	20.50	22.00
Everett, Mass.	22.00	22.50	21.50	23.00
Granite City, Ill.	21.00	21.00	20.50	21.50
Hamilton, O.	21.00	21.00	20.50	.....
Neville Island, Pa.	21.00	21.00	20.50	21.50
Provo, Utah	19.00	.....	.....	.....
Sharpsville, Pa.	21.00	21.00	20.50	21.50
Sparrow's Point, Md.	22.00	.....	21.50	.....
Swedeland, Pa.	22.00	22.50	21.50	23.00
Toledo, O.	21.00	21.00	20.50	21.50
Youngstown, O.	21.00	21.00	20.50	21.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	22.39	22.39	21.89	22.89
Baltimore from Birmingham	22.78	.....	21.66	.....
Boston from Birmingham	22.12	.....	.....	.....
Boston from Everett, Mass.	22.50	23.00	22.00	23.50
Boston from Buffalo	22.50	23.00	22.00	23.50
Brooklyn, N. Y., from Bethlehem	24.50	25.00	.....	.....
Canton, O., from Cleveland	22.39	22.39	21.89	22.89
Chicago from Birmingham	†21.22	.....	.....	.....
Cincinnati from Hamilton, O.	21.24	22.11	21.61	.....
Cincinnati from Birmingham	21.06	.....	20.06	.....
Cleveland from Birmingham	21.32	.....	20.82	.....
Mansfield, O., from Toledo, O.	22.94	22.94	22.44	22.44
Milwaukee from Chicago	22.10	22.10	21.60	22.60
Muskegon, Mich., from Chicago, Toledo or Detroit	24.19	24.19	23.69	24.69
Newark, N. J., from Birmingham	23.15	.....	.....	.....
Newark, N. J., from Bethlehem	23.53	24.03	.....	.....
Philadelphia from Birmingham	22.46	.....	21.96	.....
Philadelphia from Swedeland, Pa.	22.84	23.34	22.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	23.45	23.45	22.95	22.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	21.50	21.50	21.00	...
St. Louis from Birmingham	†21.12	.....	20.62	.....
St. Paul from Duluth	23.63	23.63	.....	24.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $26.50, base; $27.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$20.50	Lake Superior fur.	$25.00
Pitts. dist. fur	20.50	do., del. Chicago	28.34
		Lyles, Tenn.	23.50

†Silvery

Jackson county, O., base: 6-6.50 per cent $25.50; 6.51-7—$26.00; 7-7.50—$26.50; 7.51-8—$27.00; 8-8.50—$27.50; 8.51-9—$28.00; 9-9.50—$28.50; Buffalo, $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	55.10
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar

Washed gravel, duty pd., tide, net ton	$21.00-21.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	18.00
Do. barge	19.00
No. 2 lump	18.00-19.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $80.00
Do., del. Pittsburgh 85.33

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 28.00
Do., 26-28%, Palmerton 33.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman, 2% carbon 88.00
2% carbon, 93.00; 1%, 103.00
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.60-1.65

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 10.50c
Do., ton lots 11.25c
Do., less-ton lots 11.50c
67-72% carloads, 2% carbon, per lb. contained

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

chrome	16.50c
Do., ton lots	17.25c
Do., less-ton lots	17.75c

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do., less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00
15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract, any quantity, freight allowed, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do., less-ton lots 8.25c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.00
Do, smaller lots 2.10

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c
88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb. 14.00c
Do., 2% 12.50c
Spot ¼c higher

Silicon Briquets, contract carloads freight allowed, ton $69.50
Carload, spot 74.50
Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, bulk freight allowed, lb. 4.50c
Ton lots 5.00c
Less-ton lots 5.25c
Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, gross ton $97.50
Do, spot 102.50

34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: SAE 2300	Cold Drawn Bars: SAE 3100
Boston	3.88	4.06	5.06	3.85	3.85	5.66	3.71	4.78	4.61	3.46	4.13	8.63	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.40	4.60	4.50	3.51	4.09	8.59	7.19
Philadelphia	3.60	3.60	4.10	3.40	3.40	5.00	3.40	4.55	4.28	3.51	4.06	8.56	7.16
Baltimore	3.70	3.85	3.80	3.55	3.55	5.00	3.55	4.90	5.05	....	4.05	....	....
Norfolk, Va.	3.90	4.00	....	3.75	3.75	5.20	3.75	....	5.40	....	4.15	....	....
Buffalo	3.35	3.82	3.82	3.62	3.40	5.25	3.35	4.40	4.40	3.42	3.75	8.15	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.50	3.35	3.65	8.35	6.95
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.55	4.62	3.20	3.75	8.15	6.75
Detroit	3.33	3.43	3.68	3.60	3.65	5.27	3.43	4.50	4.59	3.40	3.80	8.45	7.05
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	....	4.57	3.45	4.00	8.50	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.35	4.30	4.25	3.50	3.75	8.15	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.60	4.95	4.50	3.83	4.34	8.84	7.44
Milwaukee	3.63	3.73	3.73	3.68	3.68	5.28	3.48	4.43	4.38	....	3.88	8.38	6.98
St. Louis	3.62	3.72	3.72	3.47	3.47	5.07	3.38	4.32	4.52	3.61	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Memphis	3.90	4.00	4.00	3.95	3.95	5.71	3.75	....	5.00	....	4.31	....	....
Chattanooga	3.80	3.90	3.90	3.85	3.85	5.80	3.65	....	4.40	....	4.39	....	....
Tulsa, Okla.	4.54	4.64	4.64	4.41	4.41	6.01	4.32	....	5.39	....	4.79	....	....
Birmingham	3.50	3.60	3.60	3.55	3.55	5.88	3.35	....	4.85	....	4.43	....	....
New Orleans	3.85	4.65	4.65	3.80	3.80	5.75	4.10	....	4.60	5.00	5.10	....	....
Houston, Tex.	3.50	5.85	6.25	4.05	4.05	5.65	3.95	....	5.25	....	..	....	....
Seattle	3.65	3.85	5.20	3.40	3.50	5.25	3.70	6.50	4.75	....	5.60	....	....
Portland, Oreg.	4.00	4.40	6.10	4.00	4.00	5.50	3.95	6.50	4.75	....	5.85	....	....
Los Angeles	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	5.00	4.45	6.00	10.40	9.55
San Francisco	3.50	3.90	6.00	3.45	3.45	5.05	3.45	6.40	5.15	....	6.55	10.65	9.80

	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.18	7.50	6.05	5.80	7.90
New York (Met.)	4.04	7.35	5.90	5.65	....
Philadelphia	3.85	7.31	5.86	5.61	7.71
Baltimore	3.85	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.10	5.65	5.40	7.50
Pittsburgh	3.40	7.35	5.95	5.50	7.60
Cleveland	3.30	7.30	5.85	5.85	7.70
Detroit	3.38	7.42	5.97	5.72	7.19
Cincinnati	3.65	7.44	5.99	5.74	7.84
Chicago	3.70	7.10	5.65	5.40	7.50
Twin Cities	3.95	7.45	6.00	6.09	8.19
Milwaukee	3.78	7.33	5.88	5.63	7.73
St. Louis	3.82	7.47	6.02	5.77	7.87
Seattle	5.65	....	7.80	7.65	8.45
Portland, Oreg.	5.70	....	7.80	7.65	8.50
Los Angeles	4.65	9.40	8.55	8.40	9.05
San Francisco	4.50	9.65	8.80	8.65	9.30

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds, except 0-1999 pounds (hot rolled sheets only) in New York; 300-1999 pounds in Los Angeles; 0-299 pounds (hoops only) in San Francisco; 300-4999 pounds in Portland, Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in Birmingham.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York and St. Louis; 450-3749 pounds in Boston; 500-1499 pounds in Buffalo; 1000-1999 pounds in Philadelphia; 300-4999 pounds in San Francisco and Portland; any quantity in Twin Cities.

Galvanized Sheets: Base, 0-1499 pounds in New York, Tulsa; 150-1499 pounds in Cleveland, Pittsburgh; 1-9 bundles in Baltimore, Norfolk; 1-6 bundles in Los Angeles; 300-4999 pounds in Portland, Seattle, San Francisco; 450-3749 pounds in Boston; 500-1499 pounds in Birmingham, Chicago, Cincinnati, Detroit, St. Louis; 1500 pounds and over in Chattanooga, Philadelphia; any quantity in Twin Cities.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1000 pounds and over, except 0-299 pounds in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999 pounds in San Francisco; 0-1999 in Portland.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, Aug. 31

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Quoted in dollars at current value	Continental Channel or North Sea ports, gross tons **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$21.60 5 0 0	$18.32	2 3 0
Basic bessemer	.....	19.59	2 6 0
Hematite, Phos. .03-.05	22.68 5 5 0*	.....	.....
Billets	$31.86 7 7 6	$38.34	4 10 0
Wire rods, No. 5 gage	49.14 11 7 6	43.67	5 2 6
Standard rails	$41.04 9 10 0	$48.99	5 15 0
Merchant bars	2.12c 11 0 0	1.81c to 1.90c	4 15 0 to 5 0 0
Structural shapes	1.93c 10 0 0	1.76c to 1.81c	4 12 6 to 4 15 0
Plates, ¼ in. or 5 mm.	2.11c 10 18 9	2.14c to 2.33c	5 12 6 to 6 2 6
Sheets, black, 24 gage or 0.5 mm.	2.51c 13 0 0	2.90c	7 12 6*
Sheets, gal., 24 ga., corr.	3.04c 15 15 0	3.47c	9 2 6
Bands and strips	2.29c 12 5 0	1.90c to 1.92c	5 0 0 to 5 1 0
Plain wire, base	3.76c 19 10 0	2.33c to 2.66c	6 2 6 to 7 0 0
Galvanized wire, base	4.49c 23 5 0	2.99c	7 17 6
Wire nails, base	.....	2.66c to 2.76c	7 0 0 to 7 5 0
Tin plate, box 108 lbs.	$ 4.37 1 0 3	.....	.....

British ferromanganese $80.00 delivered Atlantic seaboard duty-paid

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich Mark
Fdy. pig iron, Si. 2.5	$25.70	5 19 0(a)	$16.85	679.30	$18.81	550	$25.20	63
Basic bess. pig iron	24.30	5 12 6(a)	.....	....	.....	...	27.80 (b)	69.50
Furnace coke	4.97	1 4 2	5.58	225	6.91	202	7.60	19
Billets	31.86	7 7 6	25.52	1,029	29.41	860	38.60	96.50
Standard rails	1.83c	9 10 0	1.56c	1,405	2.20c	1,375	2.38c	132
Merchant bars	2.24c	11 12 0††	1.43c	1,304	1.76c	1,100	1.98c	110
Structural shapes	2.01c	10 8 0††	1.39c	1,268	1.76c	1,100	1.93c	107
Plates, ¼-in. or 5 mm.	2.12c	10 19 3††	1.82c	1,650	2.20c	1,375	2.29c	127
Sheets, black	2.85c	14 15 0§	2.15c	1,958‡	2.52c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.33c	17 5 0	3.14c	2,850	4.32c	2,700	6.66c	370
Plain wire	3.76c	19 10 0	2.20c	2,000	2.64c	1,650	3.11c	173
Bands and strips	2.38c	12 7 0††	1.59c	1,444	2.08c	1,300	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling not quoted, due to war interruption.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; †indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	†12.00
Bos. dock No. 1 exp.	14.00-14.50
New Eng. del. No. 1	14.00-14.50
Buffalo, No. 1	14.50-15.00
Buffalo, No. 2	12.50-13.00
Chicago, No. 1	13.50-14.00
Chicago, auto, no alloy	12.50-13.00
Chicago, No. 2 auto	10.50-11.00
Cincinnati, dealers	11.50-12.00
Cleveland, No. 1	14.50-15.00
Cleveland, No. 2	13.50-14.00
Detroit, No. 1	11.00-11.50
Detroit, No. 2	10.00-10.50
Eastern Pa., No. 1	16.50-17.00
Eastern Pa., No. 2	14.50-15.00
Federal, Ill.	11.50-12.00
Granite City, R. R.	12.00-12.50
Granite City, No. 2	11.00-11.50
Los Angeles, No. 1	12.50-13.00
Los Angeles, No. 2	11.50-12.00
L. A., No. 1 f.a.s.	15.00-16.00
L. A., No. 2 f.a.s.	14.00-15.00
N. Y. dock No. 1 exp.	13.00
Pitts., No. 1 (R. R.)	17.00-17.50
Pittsburgh, No. 1	16.00-16.50
Pittsburgh, No. 2	14.50-15.00
St. Louis, R. R.	12.00-12.50
St. Louis, No. 2	11.00-11.50
San Francisco, No. 1	12.50-13.00
San Francisco No. 2	11.50-12.00
Seattle, No. 1	11.00-12.00
Toronto, dirs. No. 1	9.25- 9.75
Valleys, No. 1	15.00-15.50

COMPRESSED SHEETS

Chicago, factory	13.00-13.50
Chicago, dealers	11.50-12.00
Cincinnati, dealers	11.00-12.00
Cleveland	14.00-14.50
Detroit	12.50-13.00
E. Pa., new mat.	16.50-17.00
E. Pa., old mat.	13.50-14.00
Los Angeles	11.00-11.50
Pittsburgh	16.00-16.50
St. Louis	9.25- 9.75
San Francisco	11.00-11.50
Valleys	14.75-15.25

BUNDLED SHEETS

Buffalo, No. 1	12.75-13.25
Buffalo, No. 2	11.25-11.75
Cleveland	10.75-11.25
Los Angeles	14.00
Pittsburgh	14.50-15.00
St. Louis	8.50- 9.00
Toronto, dealers	8.00- 8.50

SHEET CLIPPINGS, LOOSE

Chicago	8.50- 9.00
Cincinnati, dealers	7.00- 7.50
Detroit	9.00- 9.50
†Los Angeles	3.75- 4.00
St. Louis	7.50- 8.00
Toronto, dealers	4.25- 4.75

BUSHELING

Buffalo, No. 1	12.50-13.00
Chicago, No. 1	12.50-13.00
Cincin., No. 1, deal.	7.00- 7.50
Cincinnati, No. 2	2.25- 2.75
Cleveland, No. 2	8.25- 8.75
Detroit, No. 1, new	11.25-11.75
Valleys, new, No. 1	14.75-15.25
Toronto, dealers	3.75- 4.25

MACHINE TURNINGS (Long)

Birmingham	†4.50- 5.00
Buffalo	8.50- 9.00
Chicago	7.00- 7.50
Cincinnati, dealers	4.50- 5.00
Cleveland, no alloy	7.50- 8.00
Detroit	6.00- 6.50
Eastern Pa.	10.00-10.50
Los Angeles	5.00
New York	†3.50- 4.00
Pittsburgh	10.50-11.00
St. Louis	4.50- 5.00
San Francisco	5.00
Toronto, dealers	4.25- 4.75
Valleys	9.50-10.00

SHOVELING TURNINGS

Buffalo	9.50-10.00
Cleveland	8.75- 9.00
Chicago	7.00- 7.50
Chicago, spcl. anal.	8.00- 8.50
Detroit	7.00- 7.50
Pitts., alloy-free	13.00-13.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	3.75
Buffalo	8.00- 8.50
Cincinnati, dealers	3.25- 3.75
Cleveland	8.50- 9.00
Eastern Pa.	6.50- 7.00
Detroit	6.00- 6.50
New York	†2.50- 3.00
Pittsburgh	9.25- 9.75
Toronto, dealers	3.50- 4.00

AXLE TURNINGS

Boston district	†7.50
Buffalo	11.00-11.50
Chicago, elec. fur.	13.50-14.00
East. Pa., elec. fur.	13.50-14.00
St. Louis	9.00- 9.50
Toronto	4.00- 4.25

CAST IRON BORINGS

Birmingham	†6.00- 6.50
Boston dist. chem.	†4.75
Buffalo	7.50- 8.00
Chicago	6.50- 7.00
Cincinnati, dealers	3.25- 3.75
Cleveland	8.50- 9.00
Detroit	6.00- 6.50
E. Pa., chemical	10.00-11.00
New York	†3.50- 4.00
St. Louis	3.00- 3.50
Toronto, dealers	3.75- 4.25

RAILROAD SPECIALTIES

Chicago	15.25-15.75

ANGLE BARS—STEEL

Chicago	15.50-16.00
St. Louis	13.50-14.00

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	16.00-16.50
Chicago, leaf	15.00-15.50
Eastern Pa.	18.50
Pittsburgh	19.00-19.50
St. Louis	15.00-15.50

STEEL RAILS, SHORT

Birmingham	†19.00-19.50
Buffalo	17.50-18.00
Chicago (3 ft.)	16.00-16.50
Chicago (2 ft.)	16.50-17.00
Cincinnati, dealers	17.50-18.00
Detroit	17.50-18.00
Los Angeles	15.00-15.50
Pitts., 3 ft. and less	19.00-19.50
St. Louis, 2 ft. & less	16.50-17.00

STEEL RAILS, SCRAP

Boston district	†13.50-14.00
Buffalo	16.00-16.50
Chicago	13.50-14.00
Cleveland	16.50-17.00
Pittsburgh	18.00-18.50
St. Louis	14.50-15.00
Seattle	16.00

FROGS, SWITCHES

Chicago	13.50-14.00
St. Louis, cut	14.50-15.00

ARCH BARS, TRANSOMS

St. Louis	14.50-15.00

PIPE AND FLUES

Chicago, net	8.50- 9.00
Cincinnati, dealers	6.50- 7.00

RAILROAD GRATE BARS

Buffalo	10.00-10.50
Chicago, net	7.50- 8.00
Cincinnati, dealers	6.25- 6.75
Eastern Pa.	13.50-14.00
New York	†8.50- 9.00
St. Louis	8.00- 8.50

RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	17.00-17.50
St. Louis, No. 1	9.75-10.25
St. Louis, No. 2	12.00-12.50

FORGE FLASHINGS

Boston district	†8.50- 9.00
Buffalo	12.25-12.75
Cleveland	13.50-14.00
Detroit	10.50-11.00
Los Angeles	9.00
Pittsburgh	15.00-15.50

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.75-16.25

LOW PHOSPHORUS

Cleveland, crops	17.50-18.00
Eastern Pa., crops	19.50-20.00
Pitts., billet, bloom, slab crops	20.00-20.50

LOW PHOS. PUNCHINGS

Buffalo	16.00-16.50
Chicago	16.00-16.50
Cleveland	15.00-15.50
Eastern Pa., crops	17.50-18.00
Pittsburgh	18.25-18.75
Seattle	15.00

RAILS FOR ROLLING

5 feet and over

Birmingham	†14.00-15.00
Boston	15.00-15.50
Chicago	17.50-18.00
New York	†14.50-15.00
Eastern Pa.	17.50-18.00
St. Louis	16.00-16.50

STEEL CAR AXLES

Birmingham	†15.00-16.00
Boston district	†14.50
Chicago, net	17.00-17.50
Eastern Pa.	20.50-21.00
St. Louis	17.00-17.50

LOCOMOTIVE TIRES

Chicago (cut)	15.50-16.00
St. Louis, No. 1	13.00-13.50

SHAFTING

Boston district	†15.75-16.00
New York	†16.00-16.50
Eastern Pa.	22.00
St. Louis, 1¼-3¾".	15.50-16.00

CAR WHEELS

Birmingham	†13.50-14.00
Boston dist., iron	†10.00
Buffalo, steel	16.00-16.50
Chicago, iron	13.50-14.00
Chicago, rolled steel	15.00-15.50
Cincin., iron, deal.	13.50-14.00
Eastern Pa., iron	17.00-17.50
Eastern Pa., steel	18.50
Pittsburgh, iron	16.00-16.50
Pittsburgh, steel	19.00-19.50
St. Louis, iron	14.75-15.25
St. Louis, iron	15.00-15.50

NO. 1 CAST SCRAP

Birmingham	†13.00-13.50
Boston, No. 1 mach.	†11.50-11.75
N. Eng. del. No. 2	13.00-13.50
N. Eng. del. textile	12.50-13.00
Buffalo, cupola	14.00-14.50
Buffalo, mach.	15.50-16.00
Chicago, agri. net	9.50-10.00
Chicago, auto net	12.50-13.00
Chicago, railroad net	11.00-11.50
Chicago, mach. net	12.00-12.50
Cincin., mach. deal.	12.75-13.25
Cleveland, mach.	17.50-18.00
Detroit, cupola, net	13.00-13.50
Eastern Pa., cupola	17.00-17.50
E. Pa., mixed yard	14.00-14.50
Los Angeles, net	13.00-13.50
Pittsburgh, cupola	15.50-16.00
San Francisco, del.	12.50-13.00
Seattle	12.50-13.50
St. Louis, cupola	13.00-13.50
St. Louis, agri. mach.	14.00-14.50
St. L., No. 1 mach.	15.00-15.50
San Francisco	12.50-13.00
Toronto, No. 1, mach., net	12.00-12.50

HEAVY CAST

Boston dist. break.	†10.75-11.00
New England, del.	12.50-13.00
Buffalo, break.	11.50-12.00
Cleveland, break, net	13.00-13.50
Detroit, auto net	13.00-13.50
Detroit, break	10.50-11.00
Eastern Pa.	16.50-17.00
Los Ang., auto, net.	13.50
New York, break.	†11.00-11.50
Pittsburgh, break	13.00-13.50

STOVE PLATE

Birmingham	†7.50- 8.00
Boston district	†8.00- 8.25
Buffalo	11.50-12.00
Chicago, net	7.75-8.25
Cincinnati, dealers	6.25- 6.75
Detroit, net	7.00- 7.50
Eastern Pa.	13.50-14.00
New York, fdy.	†10.00-10.50
St. Louis	7.50- 8.00
Toronto dealers, net	6.50- 7.00

MALLEABLE

Birmingham, R. R.	†10.50-11.00
New England, del.	11.50-12.50
Buffalo	14.00-14.50
Chicago, R. R.	15.00-15.50
Cincin., agri., deal.	11.00-11.50
Cleveland, rail	16.50-17.00
Eastern Pa., R. R.	17.00
Los Angeles	15.00
Pittsburgh, rail	17.00-17.50
St. Louis, R. R.	12.50-13.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ %

Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbessemer	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbessemer	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-9.25
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, c.i.f. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr. low phos.	12.00
Swedish low phos.	12.00
Spanish No. Africa basic, 50 to 60% nom.	11.00
Tungsten, short ton unit, duty pd. nom.	18.50-19.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$23.00-24.00
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

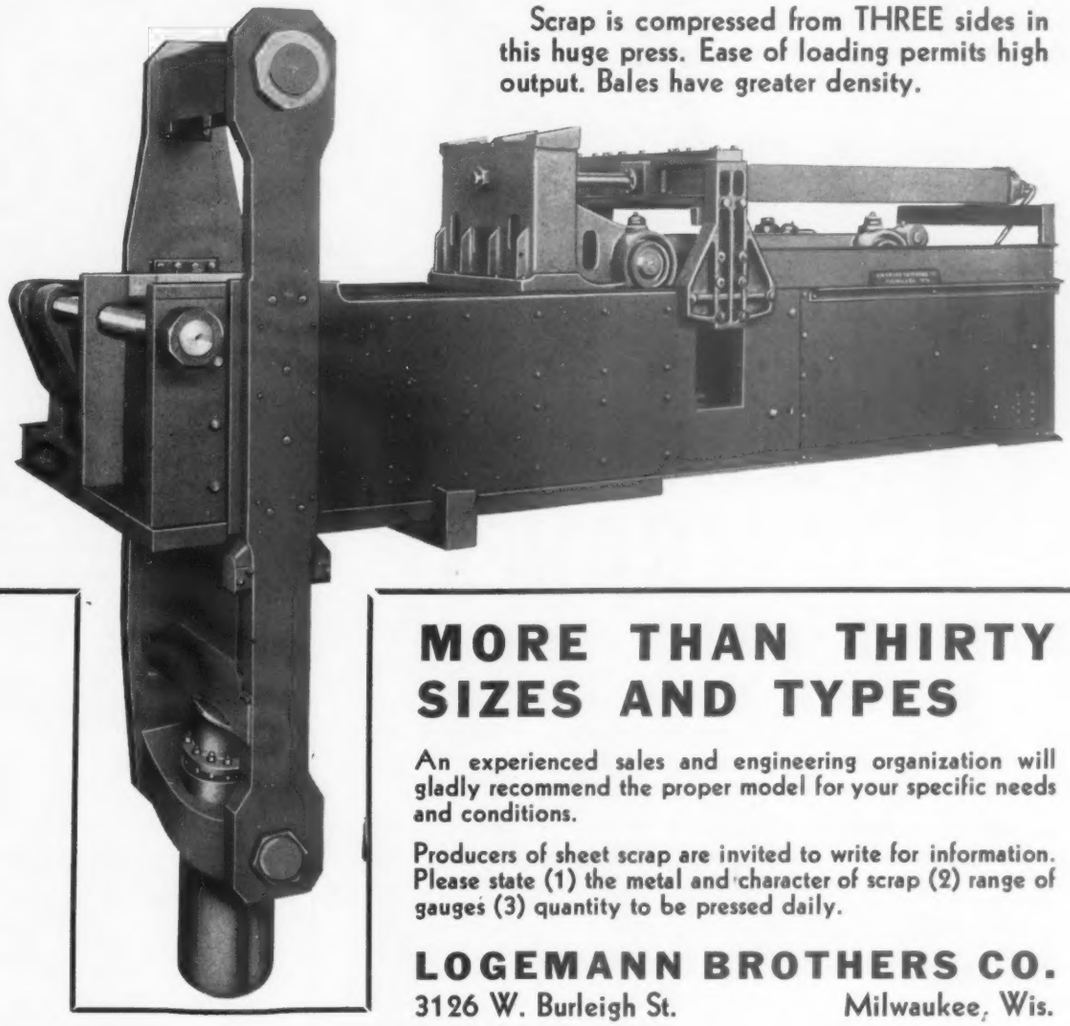
Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% nom.	29.00
So. African, 50-52% nom.	29.00
Indian, 49-50%	27.00-28.00

LOGEMANN

SCRAP PRESSES

POWERFUL RUGGED RELIABLE



Scrap is compressed from THREE sides in this huge press. Ease of loading permits high output. Bales have greater density.

MORE THAN THIRTY SIZES AND TYPES

An experienced sales and engineering organization will gladly recommend the proper model for your specific needs and conditions.

Producers of sheet scrap are invited to write for information. Please state (1) the metal and character of scrap (2) range of gauges (3) quantity to be pressed daily.

LOGEMANN BROTHERS CO.
3126 W. Burleigh St. Milwaukee, Wis.

Baling Presses . . . Pumps . . . Straighteners . . . Accumulators . . . Valves

Sheets, Strip

Sheet & Strip Prices, Page 72, 73

Pittsburgh — Sheet bookings for August showed considerable increase and the total is best this year. Automotive releases are better and this, with expanding demand in galvanized sheets and continued support from miscellaneous manufacturing sources, is supporting the market. Production continues its slow upward movement and has crossed the 60 per cent mark for the first time since December. Galvanized sheet operations last week stood at 64 per cent and there is little doubt that this production shortly will pass last year's peak. Price situation is strong and order backlog is fair.

Cleveland—Miscellaneous demand continues to hold up well. Increase in specifications is anticipated through the next few weeks, reflecting greater demand from automotive suppliers and builders. Consumption is generally better than expected, but consumer inventories are said to be larger than at any time this year reflecting effort by mills to get low price tonnage delivered. Possibility of completing this by the end of this quarter is thought doubtful, but some sellers look for specifications to be in by that time.

Chicago — Automotive tonnage, until recently relatively light, is becoming more prominent in sheet and strip releases. Requirements of Chevrolet and Ford are expected to be restricted for several more weeks, but a marked upturn in total needs of the industry is indicated for September. Miscellaneous demand is sustained in heavy volume, with mills pressing for delivery of low-price orders from such consumers by Sept. 30.

Boston — New sheet buying is light, but in scattered spots shows improvement which is expected to be continued this month. Prices are firm. Meanwhile specifications against low-priced tonnage are maintained and most will be shipped this month, although some scattered tonnage is expected to drag over into next quarter. Improvement in narrow cold strip demand, notably for specialties, is maintained. Cold strip prices are holding better.

New York—August sheet specifications were well sustained, with several leading sellers confident that they will be able to ship all tonnage booked on low priced contracts by the end of this quarter. Scattered new orders, including lots up to 200 tons, have been placed here recently at published prices.

Philadelphia—Sheet sellers expect automobile specifications to broaden business in September. Two body manufacturers here have released little tonnage for 1940 models. Some producers claim most specifications are in against low-priced contracts made last spring.

Buffalo—Production of sheet and strip steel showed a pronounced improvement this week as the Lackawanna mill of the Bethlehem Steel Co. operated a full five-day week. Orders were reported from diversified lines.

Cincinnati — Sheet specifications are improved, chiefly on automotive needs, although miscellaneous users are ordering more freely. Some galvanized tonnage has been refused because of demand for rush shipment and galvanized prices are firmer.

St. Louis—The trend of sheet activities, both production and distribution, continues upward. While miscellaneous business leads, volume has been helped by freer releases of strip by the automotive industry. Enameling stock is active with stove and household appliance makers increasing specifications.

Welded
BOX GIRDER
CRANES

SHEPARD NILES
also manufactures
- Transfer Cranes
- Grab Bucket Cranes
- Gantry Cranes
- Ice Plant Cranes
- Single I-Beam Cranes
- Jib and Bracket Cranes

• In this type of crane the rugged box section girder is formed by welding together the flanges of two wide flange I-Beams which are diaphragmed at regular intervals through their entire length.

Capacities—Welded Girder—1 to 15 tons.
Riveted Girder—up to 450 tons.

Standard Shepard Niles Crane Trolleys with their balanced drive gearing, oil bath lubrication, compact design, interchangeable unit construction are available for welded box girder cranes.

A COMPLETE LINE OF CRANES & HOISTS

SHEPARD NILES CRANE & HOIST CORP.

358 SCHUYLER AVENUE . . . MONTOUR FALLS, N. Y.

Except on some heavier gages, producers are unable to make as prompt deliveries as heretofore.

Birmingham, Ala.—While there has been no appreciable increase in output of sheets, production holds an entirely satisfactory pace with some improvement in cotton ties.

Plates

Plate Prices, Page 72

Pittsburgh—Although plate bookings for August showed a slight decline from July, there is little doubt that September's totals will record another increase. Several recently placed pipe lines will be released in September, and much of this business will come to plate mills. In addition, heavy shipbuilding tonnages have been placed recently.

Chicago—Plate business is mostly in small lots, from miscellaneous sources. Railroad equipment repairs account for moderate tonnages. The local subway continues to take large tonnages of liner plates, the latest section on which bids have been taken involving 4600 tons. Most of this business on previous sections has gone to a Youngstown, O., fabricator.

Boston—Buying of plates is mostly for shipbuilding and specified projects, the latter being light, notably as to tank needs. Boiler and structural shops are taking in tonnage sparingly, few car lots being released. August business with most sellers barely topped the previous month. Some shading continues.

New York—With August showing little improvement over July, plate sellers anticipate early increase in specifications from railroads, oil companies and boiler and heater manufacturers. Of particular encouragement is the recent inquiry from the Delaware & Hudson for 500 to 1000 50-ton hopper cars. Prices are showing a firmer tendency.

Philadelphia—Platemakers have submitted bids to the Reading Co. for about 350 tons for car repairs. No steel will be required for construction of 300 box cars which will be built at once by this road, requirements having been covered more than a year ago, with work delayed. With August business less than in July sellers expect a turn upward after Labor day.

Birmingham, Ala.—Miscellaneous bookings of plates are at comparatively high level although there still is a scarcity of railroad business.

San Francisco—Plate lettings aggregated less than 1100 tons, bringing the total to date to 35,389 tons,

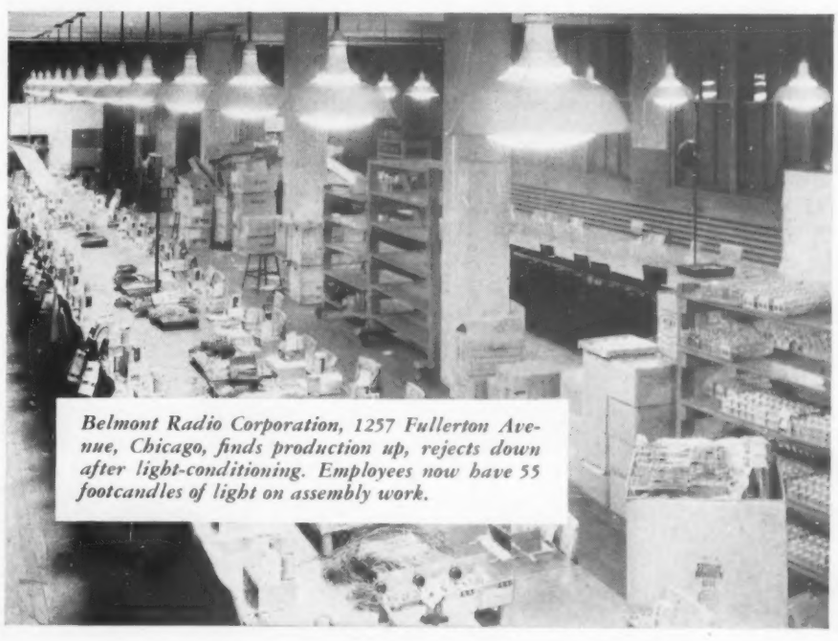
"TRY G-E LIGHT-CONDITIONING!"

says Belmont Radio Corporation . . .
and proves it with increased production

MORE LIGHT FOR YOUR MONEY
because
THEY STAY BRIGHTER LONGER

DOES better light actually increase production?
The Belmont Radio people were skeptical . . . until they had a trial fixture demonstration. Now, with 55 footcandles of light on assembly work, they report a definite decrease in rejects per unit production.
How is the lighting in *your* plant? Have employees enough light so that no unnecessary time is lost . . . so that no mistakes are made that could be avoided through better seeing conditions?
Your local electric company will measure your lighting free of charge. But whatever your problem, you'll get more light for your money if you use G-E MAZDA lamps. They're more efficient than ever this year—and they stay brighter longer!

G-E MAZDA LAMPS
GENERAL ELECTRIC



Belmont Radio Corporation, 1257 Fullerton Avenue, Chicago, finds production up, rejects down after light-conditioning. Employees now have 55 footcandles of light on assembly work.

compared with 24,955 tons for the corresponding period in 1938. Bids have also been opened on 629 tons for the bureau of reclamation for delivery at Sacramento, Calif., under invitation 33,314-A, Youngstown Sheet & Tube Co. low.

Plate Contracts Placed

1000 tons, filter basins, two contracts, New Britain, Conn., to Chicago Bridge & Iron Co., Chicago, and Bethlehem Steel Co., Bethlehem, Pa.

210 tons, castings, bureau of reclamation, Rutledge, Tenn., to Baldwin-Southwark Corp., Philadelphia.

200 tons, tanks, Aluminum Co. of America, Alcoa, Tenn., to Chicago Bridge & Iron Co., Chicago.

110 tons, 50,000-cubic foot gas-holder, Chester, Pa., to Cruse-Kemper Co. Ambler, Pa.; United Engineers & Constructors Inc., Philadelphia, contractor.

100 tons or more, boilers and accessories, navy yards, Portsmouth, N. H., Brooklyn, Norfolk and Pensacola to Riley Stoker Corp., Worcester, Mass., $379,863, spec. 9289, bureau of yards and docks, navy department, bids Aug. 16. Dravo Corp., Pittsburgh, awarded contract for same work at Anapolis, at $97,890.

Plate Contracts Pending

21,250 tons, armor plate, navy department, bids Sept. 27, chief, bureau of ordnance, Washington, spec. 225.

2500 tons, including some shapes, car repair program for Chesapeake & Ohio railroad; bids asked.

1400 tons, penstock for Mud Mountain dam, Seattle; Guy F. Atkinson Co., Russ building, San Francisco, low on general contract at $5,713,112.

629 tons, bureau of reclamation, for delivery at Sacramento, Calif., invitation 33,314-A; Youngstown Sheet & Tube Co., Youngstown, O., low.

250 tons, 25-ton revolving crane on steel pontoon, specification 9368, Mare Island, Calif., navy yard; bids Sept. 27.

The weighing unit at Parker-Kalon consists of a Fairbanks 6000-lb. all-metal self-contained warehouse scale with cabinet dial, Printomatic Weigher, and tare beam.

A Fairbanks Printomatic scale provides a complete, printed record of each stock room transaction for the Parker-Kalon Corporation of New York City. It makes a printed record that shows the *weight of material, source of supply, size of material, number of pieces,* and whether the material is *incoming* or *being withdrawn.* All of this information is automatically printed on a roll tape by the Fairbanks Printomatic. At the end of each day, the tape is used by the purchasing and auditing departments to check incoming shipments and maintain a perpetual inventory. There are no hastily scrawled records to decipher—no incorrect readings to throw the accounting system out of balance. Little errors in weight reading and recording that could add up to big losses are practically impossible in this plant.

Fairbanks Printomatic scales and their many applications are discussed in detail in a bulletin we will gladly send you. Write Fairbanks, Morse & Co., Dept. 96, 600 S. Michigan Ave., Chicago, Ill. Branches and service stations throughout the United States and Canada.

7567-SA40.67

FAIRBANKS MORSE Scales

DIESEL ENGINES · PUMPS · ELECTRICAL MACHINERY · FAIRBANKS SCALES · RAILROAD EQUIPMENT · WATER SYSTEMS · WASHERS-IRONERS · FARM EQUIPMENT · STOKERS · AIR-CONDITIONERS

Bars

Bar Prices, Page 72

Cleveland—Requirements for carbon and alloy steel bars have been fairly well maintained, with the greatest gains in specifications from automotive suppliers and builders. Any lull due to uncertainties abroad may be balanced by increased requirements from automotive sources as production schedules on 1940 models are enlarged.

Chicago—Alloy steel bar producers are expected to enter the fourth quarter with heavy orders, since revisions in extras which take effect Oct. 1 likely will stimulate forward buying. New extras on hot-rolled carbon bars also will not become fully effective until next quarter because of prior coverage. Demand from miscellaneous users and farm equipment builders generally is holding, while automotive needs are expanding gradually.

Boston—Hot carbon bar buying is steady but light, with alloy bars in small lots making relatively the best showing. Shipyards and government shops are leading consumers with jobbers building up inventories in some instances. Prices are maintained, new extras on hot carbon and alloy bars having little effect, most larger buyers having protection under the old card through this quarter.

New York—Commercial bar sellers generally reported improvement last month and look for a still further gain in September. Specifications from automobile accessory manufacturers and machine tool builders continue to expand and a better outlook is noted in the railroad field.

Philadelphia — Commercial bar tonnage has lagged the past few days but August sales exceeded those of July and the outlook is good. Producers appear confident the new extras on carbon and hot alloy bars will withstand the test expected about the end of the quarter when present contracts expire.

Birmingham, Ala.—Bar business is composed largely of reinforcing

bars, but mills report somewhat better demand for merchant bars and there has been some increase in demand from manufacturers of agricultural implements.

Buffalo—Despite lack of heavy automotive releases, bar production is sustained. Tonnage moving to toolmakers and motor accessory sources, however, has expanded. Miscellaneous orders are the chief support.

Pipe

Pipe Prices, Page 73

Cleveland—Demand for standard steel pipe made moderate improvement in August, but cast iron pipe did not fare so well. Most cast pipe foundries are operating four to five days a week, but at the expense of building up stocks or working off backlogs. Recent pipe awards include 755 tons of 10-inch steel pipe for a supply line from Port Huron to Oak Harbor, O., to Christopher Construction Co., Chagrin Falls, O.

Boston—Steel pipe buying is limited mostly to heating, sanitation and to a lesser extent miscellaneous industrial requirements, the aggregate tonnage being barely maintained. No large line pipe projects are active. Resale prices continue erratic and weak in some centers, although mill quotations are firm. Wrought and cast pipe buying is slow.

New York—Cast pipe buying by utilities for gas and water extensions, notably by the Public Service Electric & Gas Corp., New Jersey, is an important factor, taking up slack in municipal purchases. New York city is expected to ask bids about Sept. 15 on about 13,000 tons. Most purchases are for small lots, including needs for the procurement division, treasury department, New York and Newark.

Birmingham, Ala. — Pipe plants are operating at four or five days a week by virtue of small, scattered orders, but inquiries are somewhat more active.

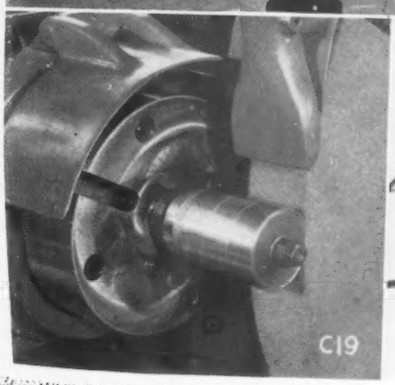
San Francisco—Cast iron pipe lettings totaled 958 tons, bringing the year's aggregate to 22,751 tons, compared with 22,118 tons for the same period last year. Pending business exceeds 2000 tons.

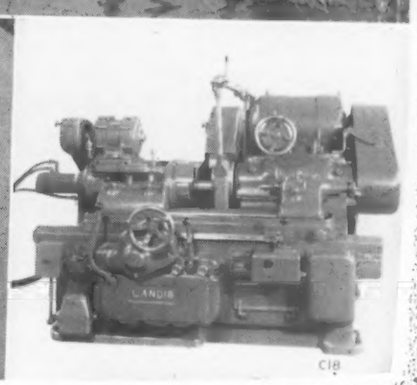
Cast Pipe Placed

538 tons, 6 to 12-inch, Class 150, Phoenix, Ariz., allocated as follows: 420 tons 8 and 12-inch, United States Pipe & Foundry Co., Burlington, N. J., and 118 tons 6-inch to Pacific States Cast Iron Pipe Co., Provo, Utah.

174 tons, 6 and 12-inch, Class 150 and

...will there be Net Profits?





EVERY industrial enterprise must enjoy net profits if it is to continue to exist. • Numerous steps can be taken to achieve this end. One of them is the installation of more modern machine tools—specifically grinding machines. This, we admit, is not always the solution, nor is it ever the whole solution, but it is frequently a contributing factor. • Take, for example, a recent Landis 10″ x 18″ Type D Hydraulic installed in the plant of a connecting rod bearing manufacturer. Initial reports show that the machine is turning out 3.2 pieces to 1 on older equipment. The resulting drop in manufacturing costs, when multiplied by similar savings which could no doubt be obtained by the use of other modern equipment, would add up in the course of a year to an attractive total. • The next time you are struggling with the problem of net profits, why not investigate the savings which modern Landis grinding equipment may be able to bring you?

296

LANDIS

INVEST IN LANDIS

LANDIS

LANDIS TOOL COMPANY, WAYNESBORO, PA.

Behind the Scenes with STEEL

Jitters

■ As we sit here writing this a squadron of 18 crack navy pursuit planes are diving up and down across Cleveland's lakefront with a deafening roar. In the ticker room in the editorial department last minute flashes are coming across the wires—a mixture of fancied fact and verified rumor of a war that is no longer a possibility but is at this very minute several hours old. For a moment our imagination carried us away and with each thundering roar from the Navy's Red Rippers we cringed with a very real fear. The air races here this week-end are certainly going to give an awful background to news which already makes a cold shiver play up and down our spine.

Slightly Mixed Up

■ Sneaking back behind the scenes here to get away from it all we find a note from our indomitable Detroit editor, A. H. Allen, who passes along a story by John D. Biggers told at a recent inspection tour of several Libbey-Owens-Ford plants, of which Mr. Biggers is president. You also know him for the national unemployment census which he directed some months ago. He did the job quick as a wink and handed back $3,000,000 unspent from the original appropriation, which was practically a sacrilege to the boys down in Washington. But to get back to our story, Mr. Biggers related an incident told him by C. F. "Boss" Kettering of General Motors. It seems that Mr. K. T. Keller, president of Chrysler Corp. received a letter from the great open spaces reading substantially as follows: "Dear Mr. Keller: *I read the other day in the papers some statements by Chas. F. Kettering, one of your vice presidents, and I am thoroughly in accord with his views. I think it is a wonderful thing that you can have such an able man in your employ and I want to compliment you and your company. To prove how strong a booster I am for Chrysler, let me say that I have a fleet of 14 Chevrolet trucks and every one is a dandy. Signed———.*" Mr. Keller sent the letter over to his pal, Mr. W. S. Knudsen, president of General Motors, with a pencil notation ribbing him on the value and effectiveness of the millions of dollars spent annually on automobile advertising. But as Mr. Biggers finished relating the incident, one able space peddler listening in with Allen and the others, rifled back the observation: *Maybe, but it also shows what a wonderful country this is, if a guy as dumb as that can own a fleet of 14 Chevrolet trucks!*

Fancy Becomes Fact

■ In the first mail Monday morning of last week, came a letter to E. C. Kreutzberg, editor of STEEL, postmarked London, England the previous Friday night at 8:15. Two and a half days from organized chaos.

Back Pat For Cadot

■ In the July issue of *Advertising Highlights* it is suggested: *For that dressed-up appearance in a small space, take a tip from the layout adorning separate department headings in* STEEL. *In black and white, and one color, these little single column spots bring a page right out of the shadow.*. These departmental thumbprints make it easier to find specific sections, and have long since proved their practical value. If they also get the nod from the decorative experts, a double orchid is due art editor Don Cadot who week-to-week makes STEEL easy on the eye and handy to use.

Standout

■ Whoever is putting the *umph* into Shell Oil's copy appeal hits a new high this week on page 47. We're going to be let down now if he doesn't come through with Snow White and the Seven Dwarfs next, or at least the Wizard of Oz.

SHRDLU

250, San Diego, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

425 tons, 42 and 48-inch, cement lined; Hartford, Conn., taking bids.

614 tons, 6 to 12-inch, Class 250, Burbank, Calif.; bids Sept. 5.

415 tons, 2 to 8-inch, or steel pipe, Safford, Ariz.; bids Sept. 7.

203 tons, fittings for 3 to 24-inch cast pipe, Chicago; bids Sept. 8.

Steel Pipe Placed

755 tons, 57,000 feet of 10-inch, supply line from Port Huron to Oak Harbor, to J. B. Clow & Son Co., Cleveland; through Christopher Construction Co., Chagrin Falls, O.

Steel Pipe Pending

625 tons, 1-inch black pipe, bureau of reclamation, invitation A-38,446-B, Odair, Wash.; bids opened.

Rails, Cars

Track Material Prices, Page 73

Chesapeake & Ohio has placed 2500 freight cars, hoppers and gondolas, among five builders. The same road is inquiring for 2500 tons of steel, mostly plates, for a car repair program in its own shops.

Chicago Rapid Transit Co. has issued formal inquiry for 1000 combination elevated-subway cars. Light-weight high-tensile steel construction is specified. Delivery would start in 1940.

Delaware & Hudson is inquiry for 500 to 1000 hoppers. This is the fourth fairly large inquiry for cars in the East in the past few weeks. No award has been made on the subway cars for the New York board of transportation.

Locomotives Placed

Boston & Maine, two 4-8-2 locomotives, to Baldwin Locomotive Works, Philadelphia.

Car Orders Placed

Chesapeake & Ohio, 2500 cars; 100 fifty-ton low-side drop-end gondolas, wooden floors, to Greenville Steel Car Co., Greenville, Pa.; 400 fifty-ton low-side drop-end gondolas, steel floors, to American Car & Foundry Co., New York; 500 fifty-ton coal hoppers, to American Car & Foundry Co.; 650 fifty-ton coal hoppers to Pullman-Standard Car Mfg. Co., Chicago; 700 fifty-ton coal hoppers to General American Transportation Co., Chicago; 150 fifty-ton coal hoppers to Ralston Steel Car Co., Columbus, O.

Pittsburgh Railways Co., Pittsburgh, 100 streamlined street cars; St. Louis Car Co., St. Louis, bodies and fabrication; Westinghouse Electrical & Mfg. Co., Pittsburgh, electrical equipment; Westinghouse Air Brake Co., brake equipment; National Malleable & Steel Cast-

ings Co., wheels; Clark Equipment Co., Battle Creek, Mich., trucks.

Car Orders Pending

Delaware & Hudson, 500 to 1000 fifty-ton hopper cars; bids asked.

Navy, two 50-ton steel sheathed box cars, bids Sept. 19; in addition to four other freight cars recently noted as pending.

Navy, 12 to 15 fifty-ton flat cars, 8 gondolas and 8 fifty-ton box cars; bids Sept. 19.

Buses Booked

White Motor Co., Cleveland: Five 26-passenger for Chicago Surface Lines, Chicago.

Wire

Wire Prices, Page 73

Cleveland—Miscellaneous demand for manufacturers' wire has been somewhat disappointing due to failure of automotive suppliers to come into the market as early as anticipated. August shipments were larger than in July Jobbers are carrying somewhat larger stocks than usual, due to price adjustments recently put into effect.

Chicago — August business was moderately ahead of July, and automotive needs are counted on to give a further boost to manufacturers' wire demand this month. Strong support continues to be received from miscellaneous users. Agricultural buying of wire products is expected to develop to fair volume.

Boston—Improvement in wire demand continues, being well diversified as to products from a wide range of miscellaneous consumers. August volume was substantially above that of July despite the fact automotive releases have been late in gaining momentum. Practically all tonnage is for prompt delivery and operations in most departments are up several points.

New York — With specifications from the automotive industry heavier and buying by the manufacturing trade well maintained, volume reaching wire mills is mounting. August tonnage was well above July in most instances. Mill operations are up a few points and most business is for prompt delivery. A large order for electric cable for the Brooklyn and Philadelphia navy yards is outstanding.

Birmingham, Ala.—Wire products are consistently active, going directly into consumer hands in most instances.

Tin Plate

Tin Plate Prices, Page 72

Pittsburgh—Operations last week held steady at 64 per cent. Sanitary can production is off somewhat, but this has been partially balanced by better specifications for general line cans. Mill stocks of tin plate are moving down somewhat and shipments are running substantially ahead of new bookings. Total placements in August were considerably lower than in July.

Shapes

Structural Shape Prices, Page 72

Pittsburgh — Privately financed jobs resulting from expansion programs in industry dominate current inquiries. In addition much public tonnage is pending and the outlook is for continued good volume.

Cleveland—Little change is noted in the structural steel market. Awards include 400 tons of piling to Bethlehem Steel Co. for Cleveland state highway project at Willow station; through Herkner Construction Co. Bids are due Sept. 7 on 700 tons of shapes for the Marshall street bridge, Youngstown, O.

Chicago — Structural fabricators note scarcity of inquiries for construction in the immediate area. A

COSTS DOWN—
PROFITS UP!

HOW? By preventing losses caused by oils that drip and leak from bearings. These bearings then run hot—wasting power. Oils do not protect bearings from wear. Machines break down, production is interrupted and repair cost rises to a high level.

NON-FLUID OIL stops all this. Proof of saving furnished by test. Send for sample—no charge—prepaid.

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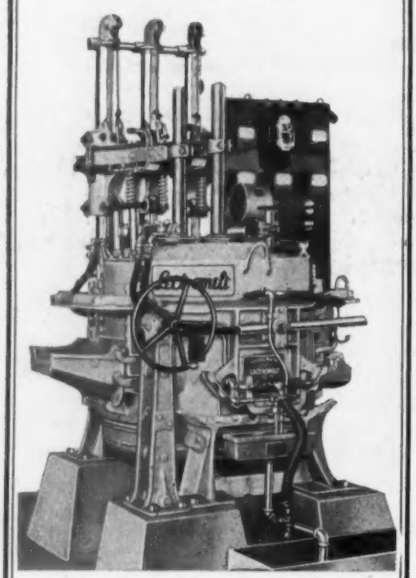

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fair volume is pending in this and nearby districts, but backlogs are receding. Awards mostly are small, including 638 tons for a Milwaukee apartment building.

Boston — Structural inquiry is gradually mounting and accumulation of pending tonnage is ahead of current awards despite the contract for an 1100-ton viaduct at Providence, R. I. Plain material is firmer, but district shops are buying little.

New York — Heavier inquiry includes a flurry in apartment building, three such structures being involved, taking approximately 4500 tons. Public work continues to account for most tonnage, but awards are light. Bids are in on a 4000-ton subway section, Brooklyn. Plain material prices are much firmer than several weeks back.

Philadelphia — Fabricated prices are stronger with most shops reporting a fairly good backlog. Approximately 3000 tons for Public Service Corp.'s powerhouse, Burlington, N. J., are up for bids Sept. 5.

San Francisco — Awards aggregated 1530 tons and brought the total to date to 86,750 tons, compared with 93,344 tons in 1938.

Shape Contracts Placed

5000 tons, office building, New England Mutual Life Insurance Co., Boston, to Bethlehem Steel Co., Bethlehem, Pa.; through Turner Construction Co.

2450 tons, Midwood high school, New York, to Harris Structural Steel Co.; through Federal Contracting Co., New York.

1700 tons, crane runways, navy yard, Brooklyn, N. Y., to American Bridge Co., Pittsburgh.

1500 tons, steel and reinforcing piling, Fort Peck dam tunnel, Wiota, Mont., to Bethlehem Steel Co., Bethlehem, Pa.

1455 tons, mill building, Champion Paper & Fibre Co., Pasadena, Tex., to Mosher Steel Co., Dallas.

1100 tons, viaduct and approaches, Providence, R. I., to American Bridge Co., Pittsburgh.

750 tons, piling, Cleveland municipal generating plant, to Carnegie-Illinois Steel Corp.; through Lombardo Bros. Co., Cleveland.

Shape Awards Compared

	Tons
Week ended Sept. 2	23,897
Week ended Aug. 26	*25,273
Week ended Aug. 19	14,241
This week, 1938	26,428
Weekly average, year, 1938	21,568
Weekly average, 1939	22,170
Weekly average, July	23,778
Total to date, 1938	633,915
Total to date, 1939	*775,945

*Revised.

Includes awards of 100 tons or more.

700 tons, power plant, Ohio Edison Co., Toronto, O., to Ingalls Iron Works, Birmingham, Ala.

638 tons, apartment building, Frederick P. Jones Co., Milwaukee, to Wisconsin Bridge & Iron Co., Milwaukee.

615 tons, Thomas Jefferson Memorial high school, Washington, to Bethlehem Steel Co., Bethlehem, Pa.

600 tons, addition to Dayton Power & Light Co., Dayton, at Millers Ford, to Burger Iron Works Co., Akron, O.

530 tons, viaduct over Missouri Pacific railroad, Independence, Kans., for state, to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

401 tons, Scott hall, Northwestern university, Evanston, Ill., to Hansell-Elcock Co., Chicago.

400 tons, piling, Cleveland state highway bridge, project No. 93, at Willow Station, to Bethlehem Steel Co., Bethlehem; through Herkner Construction Co., Cleveland.

375 tons, bridge FAGM-568-E2, Hale county, Texas, to Capitol Steel & Iron Co., Dallas.

355 tons, storage building, navy yard, Washington, to Lehigh Structural Steel Co., Allentown, Pa.; through Victor Construction Co., Washington.

330 tons, lock No. 1, St. Lucie canal, Stuart, Fla., to Virginia Bridge Co., Roanoke, Va.

320 tons, state bridge FAGH 8532, Columbia county, New York, to American Bridge Co., Pittsburgh.

310 tons, building, Public Service Electric & Gas Corp., Elizabeth, N. J., to Oltmer Iron Works, Jersey City, N. J.; through D. C. Douglas Co., Newark.

270 tons, widening Sixteenth street crossing, Chicago, Rock Island & Pacific railway, Chicago, to American Bridge Co., Pittsburgh.

250 tons, addition for underground headquarters buildings, Los Angeles, to Bethlehem Steel Co., Los Angeles, 600 tons being reported last week.

235 tons, bridge FAP-132A, Parker county, Texas, to Peden Steel Co., Raleigh, N. C.

225 tons, 51 transmission towers, Central New York Power Corp., Oswego, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.

220 tons, bridge, section 14-A, route 39, Everett, Pa., Pennsylvania turnpike, to American Bridge Co., Pittsburgh.

200 tons, state highway bridge, Orange county, New York, to Harris Structural Steel Co., New York; through John Arborio Inc., Poughkeepsie, general contractor.

200 tons, switch house building, Commonwealth Edison Co., Chicago, to Vierling Steel Works, Chicago.

200 tons, crane for drydock, Mare Island, Calif., navy yard, to Star Iron & Steel Co., Tacoma, Wash.

187 tons, bridge, Lake Mills, Wis., to Lakeside Bridge & Steel Co., Milwaukee.

180 tons, recreation building, Singer Mfg. Co., Elizabeth, N. J., to Belmont Iron Works, Philadelphia; through M. Byrnes Bldg. Co., general contractor.

175 tons, swimming pool building, Cambridge, Mass., to Lehigh Structural Steel Co., Allentown, Pa.

175 tons, press building 101, Aluminum Co. of America, Cleveland, to Bethlehem Steel Co., Bethlehem, Pa.

169 tons, Ventura river bridge, Ventura county, California, to Pacific Iron & Steel Co., Los Angeles.

165 tons, state bridge over Bayour Gulch, Frankstown, Colo., to Midwest Steel & Iron Works Co., Denver.

140 tons, bridge FA -908C, Bastrop county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.

130 tons, state bridge No. 1, RC-4019, Minoa, N. Y., to American Bridge Co., Pittsburgh.

125 tons, state highway bridge, Green county, New York, to Anthracite Bridge Co., Scranton, Pa.; through Alaimo & Son Co., Pittston, Pa.

125 tons, Green Line Bus Corp., Jamaica, Queens, N. Y., to Elmhurst Iron Works, New York.

125 tons, store building, R. E. Corp., Evanston, Ill., to Bethlehem Steel Co., Bethlehem, Pa.

115 tons, Brazoria, Tex., to Mosher Steel Co., Dallas, Tex.

115 tons, aerial ski chair ropeway, Union Pacific railroad, Sun Valley, Calif., to Poole & McGonigle, Portland, Oreg.

112 tons, Graefe Building, Sandusky, O., to Bethlehem Steel Co., Bethlehem, Pa.

110 tons, sheet piling, Ventura river for Ventura county, California, to Bethlehem Steel Co., Los Angeles.

110 tons, research laboratory, Aluminum Co. of America, New Kensington, Pa., to Ingalls Iron Works Co., Birmingham, Ala.

110 tons, engine house, Standard Brands Inc., Pekin, Ill., to Hansell-Elcock Co., Chicago.

100 tons, I-beam bridge, Brattleboro, Vt., to Bethlehem Steel Co., Bethlehem, Pa.; through Williams E. Dailey, North Bennington, Vt., general contractor.

100 tons, Crevice creek and Lake creek bridges, Idaho, to American Bridge Co., Pittsburgh.

Unstated tonnage, catwalks and shipway extensions, navy yard, Portsmouth, N. H., to West End Iron Works, Cambridge, Mass., $19,777, spec. 9320, bids Aug. 16, bureau of yards and docks, navy department, Washington.

Shape Contracts Pending

4000 tons, subway, route 101, sec. 6B, Brooklyn, Arthur A. Johnson Co. and Necaro Corp., New York, low on joint bid.

3600 tons, extension to power house, Public Service Electric & Gas Co., Burlington, N. J.

3000 tons, apartments, 240 Central Park South, New York.

1860 tons, steel piling, also 665 tons reinforcing bars, for government flood project, Tell City, Ind.; bids Sept. 8, Louisville, Ky.

1700 tons, buildings, Hills Bros. Coffee Co., Edgewater, N. J.

1386 tons, piles and bearing piles, improvement Los Angeles river channel, Los Angeles; general contract to Griffith & Co., Los Angeles Railway building, Los Angeles, at $633,798.

1300 tons, Tiffany building, New York; Turner Construction Co., New York, general contractor.

1000 tons, 17-story apartment, Thirty-seventh street and Park avenue, New York.

700 tons, apartment, Thirty-seventh street and Lexington avenue, New York.

700 tons, Marshall street bridge, Youngstown, O.; bids Sept. 7.

643 tons, shapes and rails, Mud Mountain dam, Seattle; general contract to Guy F. Atkinson Co., Russ building, San Francisco at $5,713,112.

450 tons, building, Alton Boxboard Co Alton, Ill.

450 tons, shop buildings, Fort Totten, N. Y.; James B. Rice Co., New York, low.

408 tons, Lankershim boulevard bridge for Los Angeles; Carlo Bongiovanni, 2561 Canyon drive, Hollywood, Calif., low on general contract at $344,558.

400 tons, factory building extension, Firestone Tire & Rubber Co., Noblesville, Ind.

275 tons, steel curbing, contract 12, New York, for city.

250 tons, Chicago subway, section S-6; M. J. Boyle & Co., Chicago, low for general contract.

250 tons, building addition, Montgomery Ward & Co., Chicago; Sollitt Construction Co., South Bend, Ind., general contractor.

235 tons, three spans, Westmoreland county, Pennsylvania turnpike.

230 tons, bridge, Mission street, Pittsburgh, for city.

230 tons, state bridge, North Woodstock, N. H.

225 tons, alterations to plant, National Lead Co., Brooklyn, N. Y.

210 tons, spillway bridge, Hiwassee dam, Tennessee Valley Authority, bids Sept. 13, Knoxville, Tenn.

200 tons, Franklin D. Roosevelt library, Hyde Park, N. Y., for United States government.

175 tons, cell block, state prison, Green Haven, N. Y.; Arthur Callow Co., New York, low.

165 tons, addition to Thomas Carr Howe high school, Indianapolis, Ind.

145 tons, garage building, Michigan Bell Telephone Co., Detroit.

145 tons, railroad trestle, Kings Park, N. Y., for state.

120 tons, Loyalhanna dam, Indiana county, Pennsylvania, army engineers' office.

120 tons, laboratory and greenhouse, for department of agriculture, Ithaca, N. Y.

100 tons, three bridges, one through truss and two I-beam, Newfane, Vt.; bids Sept. 8, H. E. Sargent, commissioner of highways, Montpelier.

100 tons, schedule 3558, general purchasing agent, Panama Canal, for motor car repair shop; bids opened.

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Reinforcing

Reinforcing Bar Prices, Page 73

Pittsburgh—Since new base prices have gone into effect there has been a noticeable firming in the market, and all major jobs closed since the effective date have gone at the full price. In this vicinity there have been attempts to break the market, but with no success. Inquiry is light, but the outlook is good with a large number of jobs not yet ready for bidding.

Cleveland—Awards are led by 1200 tons of bars and 750 tons of piling for the municipal generating plant, Cleveland, to Carnegie-Illinois Steel Corp., through Lombardo Bros Co., Cleveland. Fabricators are fairly busy on former bookings. Prices are firmer.

Chicago—Healy Subway Construction Co. has been awarded general contracts for two large sections of the local subway, involving 5650 tons of bars. Another section, taking 3700 tons, is pending, placing of the general contract being deferred. Awards are bolstered by 2900 tons for the Ida B. Wells housing project and 500 tons for the Chatham Park housing unit, both here. While inquiries generally are small, a large tonnage awaits placement.

Boston—Two housing projects in the Boston district and a dam in New Hampshire account for close to 6000 tons. Pending projects in smaller lots being estimated take approximately 1500 tons additional. Reinforcing bar prices are steadier, despite efforts by contractors holding contracts for larger tonnages to force greater concessions.

New York—Reinforcing bar prices are the steadiest in many months. Buying is light, although more contracts are included, the largest being 465 tons for a circumferential highway section, Brooklyn. Highway mesh demand has slackened, although a substantial tonnage for upstate work remains to be placed. Inquiry is featured by 2500 tons for a sewage treatment plant, Queens, N. Y., bids in.

Philadelphia—Inquiry includes 100 tons for additions to United States agricultural laboratory, Wyndmoor, Pa. Demand is generally quiet with total volume affected by decline in public work. Prices appear stronger.

San Francisco—Two large awards were placed, Pacific States Steel Co. taking 3010 tons for the United States indian service at Parker, Ariz., and Columbia Steel Co. 1800 tons for the bureau of reclamation for delivery at Niland, Calif. Pending business calls for more than 13,000 tons.

Concrete Bars Compared

	Tons
Week ended Sept. 2	13,046
Week ended Aug. 26	6,203
Week ended Aug. 19	3,462
This week, 1938	10,945
Weekly average, year, 1938	6,959
Weekly average, 1939	9,783
Weekly average, July	8,076
Total to date, 1938	242,949
Total to date, 1939	342,395

Includes awards of 100 tons or more.

Reinforcing Steel Awards

3010 tons, United States indian service, Parker, Ariz., to Pacific States Steel Co., Niles, Calif.

2900 tons, Ida B. Wells housing project, Chicago, to Truscon Steel Co., Youngstown, O.

1800 tons, bureau of reclamation, invitation B-42,291-A, Niland, Calif., to Columbia Steel Co., San Francisco.

1200 tons, Cleveland municipal generating plant, to Carnegie-Illinois Steel Corp.; through Lombardo Bros. Co., Cleveland.

560 tons, navy yard, Norfolk, Va., to Hall-Hodges, Inc., Philadelphia; bids in.

500 tons, Chatham Park housing project, Chicago, to Calumet Steel Co., Chicago.

465 tons, contract MS-39-15, Circumferential highway, Brooklyn, to Igoe Bros., Newark, N. J.; P. Tomasetti Co., New York, contractor.

400 tons, Delaware hospital, Wilmington, Del., to Bethlehem Steel Co., Bethlehem, Pa.; Turner Construction Co., contractor.

316 tons, grade eliminations, Long Island railroad, Aqueduct, N. Y., to Bethlehem Steel Co.; Wilson & English, New York, contractors.

290 tons, section 13-D, Pennsylvania turnpike, Bedford county, Pennsylvania, to Jones & Laughlin Steel Corp., Pittsburgh; Nelo L. Teer, Durham, N. C., contractor.

275 tons, Sideling Hill ventilation project, Fulton county, Pennsylvania, to Truscon Steel Co., Youngstown, O.; Ritter Bros., Harrisburg, Pa., contractor.

200 tons, office building, Aetna Life Insurance Co., New York, to Bethlehem Steel Co., Bethlehem, Pa.; Cummins Construction Co., contractor; through Joseph T. Ryerson & Son Inc., Chicago.

200 tons, housing project, North Bergen, N. J., to Bethlehem Steel Co., Bethlehem, Pa.; through Joseph T. Ryerson & Son Inc., Newark, N. J.; Edw. Reihl, contractor.

200 tons, Cross Island parkway, MC3916, Queens, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; through Joseph T. Ryerson & Son Inc., Chicago, Candeloro Construction Co., contractor.

150 tons, municipal power plant, Holland Mich., to Calumet Steel Co., Chicago.

138 tons, Laurel Hill ventilation project, Somerset county, Pennsylvania, to Truscon Steel Co., Youngstown, O.; Ritter Bros., Harrisburg, Pa., contractor.

125 tons, sewage plant, West Warwick, R. I., to Northern Steel Co., Boston;

James A. Monroe & Sons Co., North Attleboro, Mass., contractor.

117 tons, warehouse for Fibreboard Products Corp., Antioch, Calif., to Gilmore Fabricators Inc., San Francisco.

100 tons, infirmary building 15, Kings Park, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; Silverblatt & Lasker, contractors.

100 tons, Ventura river bridge for Ventura county, California, to Blue Diamond Corp., Los Angeles.

Reinforcing Steel Pending

5650 tons, sections D-1 and S-3, Chicago subway; general contract awarded Healy Subway Construction Co., Chicago.

3700 tons, section S-6, Chicago subway; M. J. Boyle & Co., Chicago, low for general contract but award deferred.

1400 tons, Mud Mountain dam, Seattle, Wash.; general contract to Guy F. Atkinson Co., Russ building, San Francisco, at $5,713,112.

850 tons, housing project, South Jamacia, Queens, N. Y.; bids Sept. 8.

716 tons, Lankershim boulevard bridge, Los Angeles; Carlo Bongiovanni, 2561 Canyon drive, Hollywood, Calif., low, at $344,558.

700 tons, St. Mary's hospital, Rochester, Minn.

500 tons, housing project, El Paso, Texas; general contract to Robert E. McKee, 4700 San Fernando road, Los Angeles, at $772,600.

500 tons, barracks, laundry, boiler plant, subsistence and apartment buildings, specification 9159, Coco Solo, C. Z.; bids Sept. 27.

425 tons, sewage plant, Rutherford, N. J.; F. H. McGraw Co., Hartford, Conn., general contractor.

300 tons, pumping stations, Grand Rapids, Mich.

255 tons, bridge over Russian gulch, Mendocino county, California, for state; bids Sept. 13.

200 tons, building, Eastman Kodak Co., Chicago.

150 tons, building, General Electric Co., Detroit.

100 tons, grading project, route 6, section 9, Passaic county, New Jersey; bids Sept. 15, Trenton.

Pig Iron

Pig Iron Prices, Page 74

Pittsburgh—Concerted efforts to ship the balance of low priced tonnage appears to be getting results. Reports of new placements in fair volume made at the market have been verified, and although iron has been offered below the market quotation, there is no report of any contracts having been made on this basis.

Cleveland—Shipments during August were 20 to 25 per cent greater than July and a more encouraging factor is that foundry coke shipments recorded substantially the same increase. Demand from automotive parts suppliers and producers has not yet developed as expected, jobbing foundries are fairly busy and requirements from agricultural implement manufacturers should show encouraging gains. A pick-up in demand from railroad shops is also noted.

Chicago—Consumers show more interest in fourth quarter pig iron needs, but producers have not announced prices for that period. Ordinarily books would be expected to be opened at this time. Foundry operations are expanding gradually, aided by better schedules of some automotive and farm equipment interests. August pig iron shipments in this and adjacent districts were 20 per cent ahead of July.

Boston — Spotty improvement in foundry melt is accompanied by a mild improvement in pig iron demand, shipments being mostly in small lots. Movement of iron to consumers last month was slightly ahead of July, but the number of releases made a better showing.

Philadelphia — Prices on pig iron are expected to be reaffirmed when books are opened for fourth quarter, if business shows expected improve-

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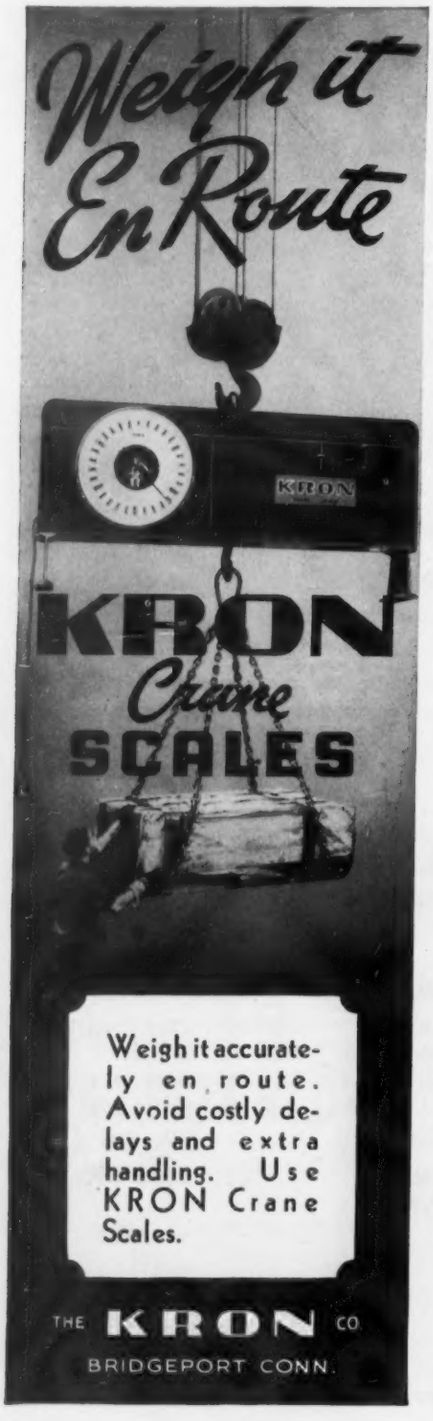
ment. Higher figures may be named on spot business after next quarter gets under way, in the opinion of trade leaders here. Some sellers report a decline in specifications in August, while others experienced some increase.

Cincinnati — Better shipments of pig iron reflect a slight increase in melt and also furnace pressure to get out all tonnage on contracts taken nearly a year ago at lower prices.

Buffalo — The first tangible appearance of future buying in pig iron was witnessed during the past few days as several consumers came into the market to protect against possibility of being caught short or forced to pay higher prices. The result was a better sales volume for August than July.

St. Louis — Sellers are taking a firmer attitude. Contracts now being made are with the understanding that the tonnage must be delivered within the period specified, and not carried over into the following quarter. Buyers are apparently satisfied with this proviso and a fair volume has been placed under it. August shipments of both pig iron and metallurgical coke were higher than in July. Prices are firm.

Toronto, Ont.—Merchant pig iron sales in August were larger than in July and September promises a further gain. Melters show interest and foundry and malleable sales are larger, though in small lots. No forward contracts are being made.



Scrap

Scrap Prices, Page 76

New York — With considerable scrap tonnage yet to be shipped on cartel purchases present uncertainties of the European situation has caused slowing of activity for export. Meanwhile some buying continues at unchanged prices, but the situation is mixed. Possible effect on domestic scrap prices should exports be halted or seriously curtailed is the subject of conjecture, the general feeling being that prices would weaken as export buying undoubtedly has supported scrap prices along the Atlantic seaboard. Domestic buying is slightly more active, with prices firm.

Pittburgh — Although there have been no sales of No. 1 heavy melting steel here to indicate a higher quotation, there is no doubt the market is considerably firmer. This has been backed up by added strength in the secondary steel market, and No. 2 heavy melting steel is now quoted at $14.50 to $15. Current railroad offerings are quite heavy, and bidding on the list which closed this week was spirited. The market is marking time pending disposition of this material.

Cleveland — Little movement is shown in scrap, consumers having sufficient for current needs. Lake arrivals are somewhat smaller. Little free scrap is available in many grades. Prices are unchanged.

Chicago — Scrap prices are holding at approximately the levels prevailing the preceding weeks of August. No. 1 steel continues $13.50 to $14. Mills have been successful in resisting efforts of sellers to obtain more than $14, and the latter generally are paying $13.75 to $14 in covering. Railroad offerings have brought up to $14.75. Shipments against contracts are steady.

Boston — Iron and steel scrap prices are firm with any changes tending upward. This is doubtless due largely to the strong market for export with more grades involved in recent heavy boat-loadings. Domestic shipments are also improved.

Philadelphia — Scrap prices continue strong with several price increases, particularly in specialties. Most grades for domestic use are unchanged following the recent increases. At least three district consumers have paid $17, delivered, for No. 1, which represents the top of the current spread. Dock prices on steel scrap are strong, with $16 and $14.75 freely paid on No. 1 and No. 2, respectively, and with 25 cents higher offered on occasion. Scrap for export is increasingly scarce, accounting for a decrease in shipments in August from the high of 36,000 tons in July.

Buffalo — Consumers and sellers are marking time, awaiting outside developments. Increase in the ingot rate has buoyed sentiment among dealers. Exporters continue to take supplies from nearby areas which usually sell to local mills. Inquiries for cast scrap have also been made here from Canada.

Detroit—Although scrap supplies continue to increase, little change is observed in the market here. Current evenness probably will prevail until after Labor day at least.

Cincinnati—Scrap dealers are proceeding cautiously. Prices are unchanged and fairly steady, with movement to mills unaffected.

St. Louis — Two east side mills purchased 15,000 tons of No. 1 heavy melting steel and 1000 tons of cast scrap. For 10,000 tons, $12 was paid and for 5000 tons $12.50. The price of the smaller tonnage represents an advance of 50 cents per ton, while the $12 figure was unchanged from the last previous purchase by these interests. Offerings are somewhat freer, but not liberal.

Milwaukee—Readvertised bids for salvage of the old Illinois Steel Co. plant on Jones island, Milwaukee, brought a bid of $213,675 from Advance Mfg. Co., Milwaukee. Scrap salvage is estimated at 25,000 tons. Former bids were topped by $131,160. Plant is owned by the city, which profits $82,515 by rejecting first bids.

Toronto, Ont. — Prices are unchanged in spite of efforts by deal-

ers to obtain more. Demand is steady and mills are renewing short term contracts. Steelmaking grades are moving freely to Hamilton mills. Export shipments are fairly heavy. No. 1 machinery cast commands a premium of 50 cents. Offerings are below normal.

Warehouse

Warehouse Prices, Page 75

Pittsburgh — Volume of business is increasing substantially. August is the best month since October, 1937, increasing orders are coming in all products. The price situation is excellent, with no weakness reported.

Cleveland — Buying continues steady and in some instances slight improvement has developed. Daily average shipments last month were generally better than July, and further gains are seen for September. Prices are generally steady.

Chicago—The month closed satisfactorily, sales being well sustained instead of declining as is not uncommon for the period. The outlook is favorable.

Boston — Improvement in warehouse sales is expected early in September, some jobbers noting a trend in that direction late last month. The number of orders is well maintained, but generally small individually. Demand is well diversified. Prices on most products are steady with some scattered shading.

New York—Warehouse volume declined during the last two weeks of August, bring total volume for the month slightly under July. Standard lines, however, gained slightly, the decline being accounted for by a drop in demand for reinforcing and heavier products. Lighter specialties move steadily.

Buffalo—Distributors are voicing strong objection to new price extras. Roughly, warehouses would be paying $3 to $5 a ton more on hot-alloy bars under the new setup. Sales for August were a shade above the volume for July.

Cincinnati—Individual orders for steel from warehouses are heavier, bringing better tonnage for August than in July. Better demand for building materials has developed, with most sales small. Prices are steady.

St. Louis—August volume of warehouse sales will run moderately over July. Requirements are more diversified than at any time in recent months. Some carlot shipments have been made, but orders for the most part are small. Prices are firm.

Steel in Europe

Foreign Steel Prices, Page 75

London — (*By Radio*) — Production of iron and steel in Great Britain continues at capacity, largely for government defense work and immediate delivery, for ordinary commercial business is restricted. Deliveries are extended but consumers generally are well covered. Present ore and coke supplies are considered sufficient and semifinished output is supplemented by increased Continental tonnages. A substantial rail order for China has been received.

The Continent reports some decline in export business although volume is satisfactory. Prices are firm and works are well booked, with output high.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 73

New York — Due principally to better releases from the automobile industry, bolt and nut specifications

TORONTO ACID BRICK
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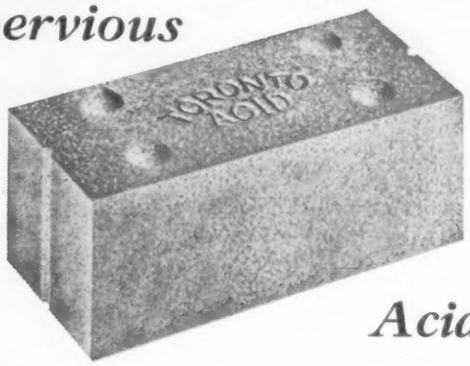

to any Acid Action

■ Repressed Toronto Acid Brick, accurately molded in stock or special shapes, are completely DEAERATED, and as a result are ACID PROOF. It is THE brick to use with basolit, the acid proof cement joint, to make tank walls and floors impervious to any acid action. Toronto Acid Brick are laid at lower labor cost, because of their shape. Requests for additional information will be courteously fulfilled.

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NATIONAL STEEL

THE HANNA FURNACE CORPORATION
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Buffalo Detroit New York Philadelphia Boston

this month continue to surpass those of July. Better shipyard releases also are a factor, with the outlook in this direction encouraging for some months.

While some competition on direct consumer business is coming from jobbers, who are converting some of their low-priced material into cash, manufacturers feel more encouraged over the price situation than in several months.

Nonferrous Metal Prices

Aug.	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
26	10.50	10.50	10.12½	*	*	5.05	4.90	4.75	20.00	12.00	35.00
28	10.50	10.50	10.12½	48.12½	47.75	5.05	4.90	4.75	20.00	12.00	35.00
29	10.50	10.50	10.12½	49.00	48.25	5.05	4.90	4.75	20.00	12.00	35.00
30	10.50	10.50	10.12½	48.75	48.00	5.05	4.90	4.75	20.00	12.00	35.00
31	10.50	10.50	10.12½	49.50	48.00	5.05	4.90	4.75	20.00	12.00	35.00
Sept. 1	10.75	10.75	10.37½	*	*	5.05	4.90	4.75	20.00	12.00	35.00

*—Nominal.

MILL PRODUCTS

F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 10.50c Conn. copper

Sheets

Yellow brass (high)	16.85
Copper, hot rolled	18.62
Lead, cut to jobbers	8.30
Zinc, 100 lb. base	9.75

Tubes

High yellow brass	19.60
Seamless copper	19.12

Rods

High yellow brass	12.19
Copper, hot rolled	15.12

Anodes

Copper, untrimmed	15.87

Wire

Yellow brass (high)	17.10

OLD METALS

Nom. Del. Buying Prices

No. 1 Composition Red Brass

New York	6.00-6.25
Cleveland	6.62½-6.87½
Chicago	6.25-6.50
St. Louis	6.37½-6.62½

Heavy Copper and Wire

New York, No. 1	8.00-8.12½
Cleveland, No. 1	7.87½-8.12½
Chicago, No. 1	7.87½-8.12½
St. Louis	7.87½-8.12½

Composition Brass Turnings

New York	5.25-5.50

Light Copper

New York	6.50-6.75
Cleveland	6.12½-6.37½
Chicago	6.25-6.50
St. Louis	6.37½-6.62½

Light Brass

Cleveland	3.62½-3.87½
Chicago	4.00-4.25
St. Louis	3.87½-4.12½

Lead

New York	4.20-4.45
Cleveland	4.00-4.25
Chicago	4.00-4.10
St. Louis	3.85-4.00

Zinc

New York	2.70-2.75
Cleveland	2.25-2.50
St. Louis	2.50-2.75

Aluminum

Mixed, cast, Cleveland	7.75-8.00
Borings, Cleveland	6.25-6.50
Clips, soft, Cleveland	14.75-15.00
Misc. cast, St. Louis	7.00-7.25

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	11.25
Standard No. 12 aluminum	11.75-12.25

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Baltimore, Md.

Nonferrous Metals

New York—Rapid developments in metal markets immediately followed the outbreak of hostilities in Europe. Heavy demand which resulted was not fully satisfied and prices strengthened.

Copper—All leading producers raised electrolytic ¼-cent late Friday to the basis of 10.75c, Connecticut. Sales of resale metal were made in the outside market at 11.00c following a sharp rise in futures on the Commodity Exchange. Wire drawers and rolled product fabricators advanced their prices proportionately. Brass ingot prices rose ½-cent on all grades except No. 1 yellow which rose ¼-cent. Sales were heavy at the close of the week.

Lead—Consumer buying interest was revived by developments abroad and consumers bought actively. Offerings were limited to September and October delivery but sellers were forced to draw on reserves to meet the demand. Prices closed strong at 4.90c, East St. Louis.

Zinc—Some sellers were unwilling to take business pending a clearer view of the foreign situation while others booked moderate tonnages for regular customers for delivery through October. Prices held at 4.75c, East St. Louis, for prime western.

Tin—Due to uncertainty regarding war risk insurance and sterling rates and availability of shipping facilities from producing centers, sellers were unwilling to make any offerings at the close of the week when the Straits spot price was estimated at 50.50c to 51.00c.

Semifinished

Semifinished Prices, Page 73

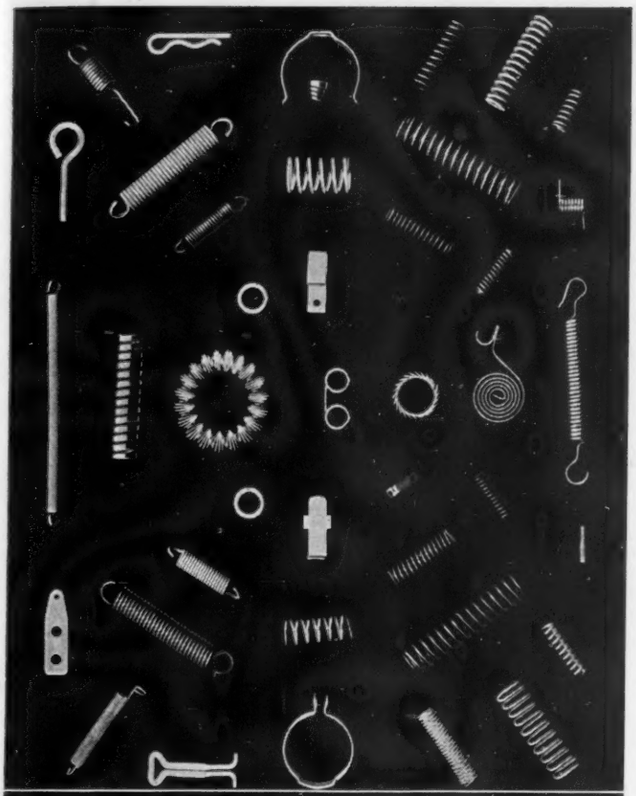
Bookings of semifinished steel have been lighter during August than in July, although shipments are heavier. It is expected tonnage will continue to increase during September.

Iron Ore

Iron Ore Prices, Page 76

Cleveland — Lake Superior iron ore consumed during July totaled 3,143,337 gross tons, against 2,829,667 tons in June and 1,674,721 tons in July, 1938, according to the Lake Superior Iron Ore association. Stocks at lower lake ports and furnaces as of Aug. 1 follow:

	Furnaces	Lake Erie docks	Total
August 1	24,195,916	4,311,327	28,507,243
Month ago	21,609,841	4,251,396	25,861,237
Year ago	30,655,968	5,190,192	35,846,160



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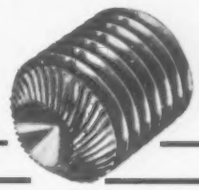

Fig. 1641

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with the Knurled Points

are 1-STRONG 2-ACCURATE and 3-WON'T SHAKE LOOSE

Fig. 1645 Pat. App. for

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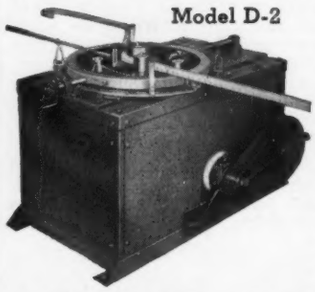
Model D-2



The Model D-2 Kardong Bender is a Four Direction Horizontal bender. With this bender when binding large bars it is not necessary to turn bars over to make reverse or second bends or 180 degree hook bends. The Model D-2 is equipped to bend bars around collars from 2 inch to 6 inch in diameter. Also made to bend up to 8 inch in diameter. Capacity of Model D-2 1¼ inch Square Bars. The Model D-2 is a production bender for concrete reinforcing steel for shop or fabricating plant. Ask for our catalog of our complete line of reinforcing bar benders.

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Construction and Enterprise

Michigan

DETROIT — Hydro Mfg. Co. has awarded contract to Fullerton Construction Co., Detroit, for construction of a factory and office building on East Outer drive. H. Augustus O'Dell, Detroit, is architect.

JACKSON, MICH.—Western Stamping Co., 1613 Wildwood avenue, has been organized to manufacture metal stampings; Arthur W. Poole, Parma, Mich.

KALAMAZOO, MICH.—American Cyanamid & Chemical Co., New York, subsidiary of American Cyanamid Co., is erecting a $300,000 factory building here.

LANSING, MICH.—John Bean Co. has plans for construction of a combined factory and office building, 3 stories, 40 x 200 feet.

SAGINAW, MICH. — Saginaw Metal Products Co. has been incorporated to deal in steel and iron; William J. Brydges, 409 South Warren avenue, Saginaw.

Connecticut

NORWALK, CONN.—C. R. Gibson & Co., 118 East Sixteenth street, New York, plans 1-story, 100 x 200-foot factory here, to cost $70,000. L. F. Caproni, 1221 Chapel street, New Haven, Conn., engineer.

Pennsylvania

PHILADELPHIA — Coatesville Plate Washer Co., Coatesville, Pa., has broken ground for a plant addition, 38 x 120 feet, of steel and concrete construction, to provide for an increase of approximately 100 per cent in production of stampings. Some additional equipment may be purchased. R. L. Batteiger is president.

Illinois

CHICAGO — Eastman Kodak Co., Rochester, N. Y., will install motors and controls, regulators, conveyors and other equipment in three-story branch plant here. Cost about $500,000 and bids will be taken soon. Schmidt, Garden & Erickson, 104 South Michigan avenue, Chicago, architects.

EAST MOLINE, ILL.—Peoples Light & Power Co., Moline, has approved plans for expansion and improvements in power substation here. Work will begin immediately.

Indiana

RICHMOND, IND.—Municipal light and power department is arranging an expansion and modernization program at power station to be carried out during the next three years, estimated to cost about $920,000. Work will include installation of new turbine-generator unit and accessories, boilers and auxiliary equipment, extensions and improvements in power stations and distribution lines.

Alabama

BIRMINGHAM, ALA.—Power room of Southern Cement Co., George C. Walter, vice president, was recently damaged by fire.

BIRMINGHAM, ALA.—Southern Wheel division of American Brake Shoe & Foundry Co., 700 Sixth avenue, south, has plans for demolition of buildings on present site and erecting new steel frame and corrugated building. Estimated cost $100,000.

HACKLEBURG, ALA.—Thomas Alabama Kaolin Co. has acquired seven-acre site for erection of processing and refining plant.

MOBILE, ALA.—Mobile Steel Co., Joseph A. Mighell, president, has under way a $10,000 expansion program, including installation of an overhead crane with 57-foot span.

MOBILE, ALA.—Alabama Power Co., Birmingham, Ala., has plans prepared for construction of steam generating plant near here, to cost about $3,500,000.

WENONAH, ALA.—Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., proposes to build ore conditioning and sintering plant here at cost of about $2,000,000.

Maryland

BALTIMORE—E. Eyring & Sons Co., 808 South Conkling street, has contract for 1-story, 100 x 180-foot addition to foundry at 4901 Philadelphia road for Harry C. Weiskittel.

SALISBURY, MD. — Martin & Schwartz Inc., Buffalo, will establish plant in building on Mill street for manufacture of gasoline pumps.

District of Columbia

WASHINGTON—National Terminal Co. of Washington, Allen V. deFord, president, 1729 Twentieth street, Northwest, plans construction of centralized food terminal warehouse. Will install modern equipment, including automatic stackers, and electric motor trucks. Cost estimated at $1,034,000.

WASHINGTON—Purchase section, national bureau of standards, will take bids until Sept. 7 for furnishing equipment for new high voltage laboratory, now under construction, as follows: 1,050,000-volt cascade-type transformer set, with high-purity sine-wave motor-generator set, 2,000,000-volt impulse generator and auxiliary equipment.

WASHINGTON—Office of the general purchasing officer will open bids at 10:30 a.m. Sept. 8 for one motor-operated bending roll, light plate, horizontal, pinch type, with slip roll feature, 7¼ to 8-inch rolls, capacity ¼-inch x 72 inches, complete with 7½-horsepower motor.

Kentucky

LOUISVILLE, KY.—Buckeye Cotton Oil Co. plans installation of motors and controls, regulators, conveyors and other equipment in proposed addition to local mill for solvents production. Cost estimated at $350,000.

Florida

DANIA, FLA.—Florida Power & Light Co., Bryan C. Hanks, president, Miami, Fla., plans to spend approximately $3,000,000 for improvements to the Dania plant, including installation of 25,000-kilowatt steam turbine generator, enlarging and revamping transmission and distribution system, erecting addition to power plant.

HOMESTEAD, FLA.—City, Frank B. LaRue, light and water commissioner, plans construction of addition to light and power plant; will purchase additional generating plant and diesel engine. Cost $60,000. William Sydow, engineer, 3461 Main Highway, Coconut Grove, Fla.

TAMPA, FLA.—Polk Co., Haines City, Fla., has concluded arrangements for building a citrus canning plant, and will begin construction at once. Modern machinery will be installed. Estimated expenditure $65,000.

Georgia

ATLANTA, GA.—City, William B. Hartsfield, mayor, has preliminary plans by Robert & Co., Bona Allen building, for incinerator and waterworks, costing about $1,050,000.

ATLANTA, GA.—Coca Cola Bottling Co., 560 Edgewood avenue, northeast, has plans by George Harwell Bond, architect, Candler building, Atlanta, for erection of bottling plant, 2 stories, 60 x 90 feet; and shops and garage units.

LAWRENCEVILLE, GA. — General Shoe Corp., H. J. Jarman, president, 511 Gallatin avenue, Nashville, Tenn., proposes to acquire building here and in-

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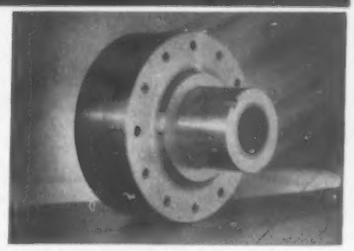

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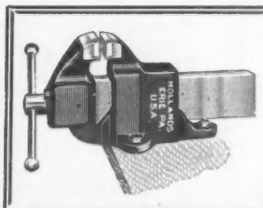

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South Carolina

GREENVILLE, S. C.—Bahan Textile Machinery Co., 104 Hudson street, has begun erection of 1-story building, 75 x 105 feet, to cost $10,000.

ORANGEBURG, S. C.—Orangeburg-Aiken Hydroelectric commission has plans under way for new hydroelectric generating plant on Edisto river. A steam-electric power plant will be built at Graniteville, S. C., for auxiliary service. Cost over $1,000,000. D. T. Duncan Engineering Co., Ninety-Six, S. C., consulting engineer.

Tennessee

KNOXVILLE, TENN.—Knoxville Electric Power and Water board, Max Bartlett, manager, has approval of REA for $81,000 loan for extension of electric lines.

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Arkansas

FORT SMITH, ARK.—William O. Martin Inc. proposes erection of plant to manufacture engine stokers.

Oklahoma

TIPTON, OKLA. — Southwest Rural Electric Co. has REA allotment of $138,000 to build 156-mile transmission line.

Wisconsin

MERRILLAN, WIS.—Village council plans modernization and rebuilding of municipal hydroelectric power plant, including equipment installation. G. L. Van Fleet Co., Dubuque, Iowa, consulting engineer.

Minnesota

DULUTH, MINN.—Standard Oil Co., J. W. Honomichl, division manager, has awarded contract to J. D. Harrold Co., for construction of a 4-story storage and warehouse building, 90 x 174 feet, to include conveyors and other equipment, plus nine additional storage tanks, total cost to be about $150,000.

MINNEAPOLIS—Minneapolis Wrought Washer Co. plans immediate construction of 1-story factory addition, 25 x 56 feet, and installation of additional equipment.

MINNEAPOLIS—Lynn Mfg. Co. has been incorporated to manufacture electrical machinery and equipment, by W. W. Barkman, Ethel Barkman and Lynn Carlson.

MINNEAPOLIS—D. W. Onan & Sons, manufacturers of saw rigs, and other equipment, has awarded contract to Crown Block Co. for construction of 1-story factory addition, 50 x 142 feet.

SLEEPY EYE, MINN.—Brown County Rural Electric association, Joseph Mathiowetz, secretary, is taking bids to Sept. 8, 1 p.m. on constructing approximately 144 miles of rural transmission lines. George Taus, 5024 Indianola avenue, Minneapolis, is consulting engineer. Certified check of 5 per cent to accompany bid.

ST. LOUIS PARK, MINN.—Prest-O-Lite Co. Inc., acetylene manufacturer, is now taking bids for construction of a new factory here, a suburb of Minneapolis. Jack Williams, 422 Washington avenue, North, Minneapolis, is district manager.

ST. PAUL—Fruehauf Trailer Co., A. K. Tice, manager, has awarded contract to R. C. Collins, Kansas City, Mo., for construction of 1-story shop and warehouse, 100 x 240 feet, to cost about $100,000, including equipment.

Texas

MIDLAND, TEX.—Shell Oil Co. Inc., Shell building, St. Louis, plans installation of motors and controls, air compressors, conveyors, pumping machinery and other equipment in new gasoline processing plant here. A power house will be built. Cost about $1,000,000.

South Dakota

WAGNER, S. DAK.—City council is securing estimates on construction and operation of a municipal light and power plant. H. S. Nixon, Grain Exchange building, Omaha, Nebr., is consulting engineer.

Nebraska

COLUMBUS, NEBR.—Loup River Public Power district, Harold Kramer, secretary, is taking bids to Sept. 12 on new electric distribution equipment. Harza Engineering Co., 205 West Wacker drive, Chicago, consulting engineer.

OMAHA, NEBR.—Searle Petroleum Co., H. A. Searle Jr., president, plans construction of an oil refinery. Work will begin about Oct. 15.

Iowa

BREDA, IOWA—Village, A. R. Bohnenkamp, clerk, has made application to WPA for funds to finance cost of constructing sewage disposal plant, to cost about $24,000.

BUCK GROVE, IOWA—City, J. J. Finigan, city clerk, will vote Sept. 11 on establishing a waterworks plant, including reservoirs, mains, filters, pumps and machinery.

CHEROKEE, IOWA—State board of control, H. C. White, chairman, Des Moines, Iowa, will take bids about Oct. 1 on constructing sewage treatment plant at Cherokee state hospital to cost $60,000. Buell & Winter, 508 Insurance Exchange building, Sioux City, Iowa, consulting engineer.

COUNCIL BLUFFS, IOWA—WPA has approved a $32,013 project to construct a waterworks at Carter lake. Leo N. Hintgen, Council Bluffs, state field engineer.

FORT MADISON, IOWA—State board of control, Des Moines, Iowa, is completing plans for construction of a power plant at the state penitentiary here, to cost about $170,000. H. J. Liebbe, Des Moines, architect.

MOVILLE, IOWA—Woodbury County Rural Electric Co-operative, Dale Schriener, superintendent, will take bids about Sept. 15 on constructing 125 miles of rural transmission lines. Buell & Winter, 508 Insurance Exchange building, Sioux City, Iowa, consulting engineers.

WOODWARD, IOWA—State board of control, H. C. White, chairman, Des Moines, Iowa, will take bids early in October for erection of sewage treatment plant at Woodward state hospital to cost about $50,000. Howard R. Green Co., 417 First avenue, South, Cedar Rapids, Iowa, consulting engineer.

Montana

TWIN BRIDGES, MONT.—REA has given preliminary consideration to application for $134,000 additional funds of the Jefferson Valley Electric Co-operative, Guy D. George, secretary, to finance construction of 134 miles of rural transmission lines. J. M. Garrison, State Water Conservation board, Helena, Mont., is consulting engineer.

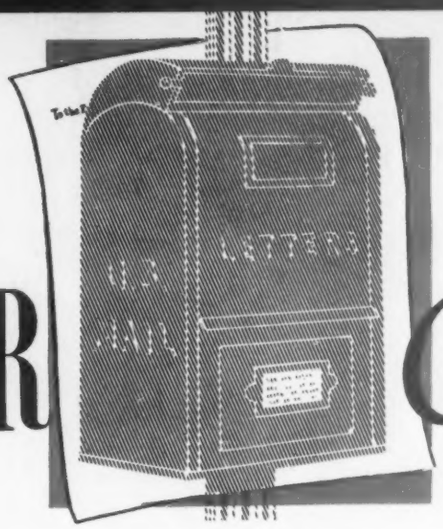
Pacific Coast

LOS ANGELES—Essick Machinery Co., Los Angeles, is erecting a new machinery building at Fourteenth street and Santa Fe avenue.

LOS ANGELES—Jackson Iron Works, 3057 East Slauson avenue, Los Angeles, is erecting a new fabricating plant and storage building at 4839 Patata street, Los Angeles, at cost of about $13,700.

TACOMA, WASH.—City water department, W. A. Kunigk, superintendent, will take bids soon for switchboard and electrical equipment for new pumping station; also will take bids for four motor-driven vertical pumping units, each with capacity of 3500 gallons per minute; two motor-driven deep well pumping units with combined rate of 8400 gallons per minute, and complete auxiliary equipment.

READER Comments



Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Tax Component a Factor

To the Editor:

I have just read the article by Col. R. R. Lutz (STEEL, Aug. 21, p. 36) and I wonder if this gentleman is in a position to describe the effect on unemployment of the greatly varying tax component in each dollar of the national income. While probably not particularly important it would be well to include in addition to the tax imposed directly by government the taxing power now delegated to labor unions and a few businesses.

The National Industrial Conference board, a few years ago, was a great help in my own research on the effect of unequal taxation and from the figures furnished me at the time it was a wonder that unemployment was not more serious than it was.

In my opinion, the solution of unemployment resides solely in the inequality of the tax component of our national income dollar, but unfortunately human nature is such that the obvious remedy is not likely to be applied.

S. C. BOND

Modern-Bond Corp.,
Wilmington, Del.

Editors' Note—Mr. Lutz answers Mr. Bond's question as follows:

To the Editor:

Mr. Bond's question is a very difficult one to answer. To the extent that the taxes imposed under the present tax system are inequitable or discriminatory between groups, or even members of the same group, they contribute to economic maladjustment and unemployment. A rapidly rising ratio of taxes to national income tends to produce unemployment in the private branch of the economy, for the reason that increasing tax costs act as deterrents to production and the assumption of business risks. Similarly, rank discrimination against a particular industry in assessing the total tax burden will affect costs in that industry, the prices at which its product can be sold, and the volume of employment within the industry.

There can be no question that high taxation has an adverse effect on employment, but to determine within any reasonable degree of accuracy its extent, in statistical terms, would constitute a task of the first magnitude, and in my opinion, with small chance of success.

R. R. LUTZ

National Industrial Conference Board
New York

Urges Rankine Memorial

To the Editor:

I write to bring to your attention and to ask your support for the Intercollegiate Rankine Memorial Movement, a movement to collect from the seventy-five or eighty thousand college engineering students, in attendance at the nearly two hundred colleges of the United States, a fund of $15,000 to erect at the University of Glasgow, Glasgow, Scotland, a memorial to the late celebrated Professor William John MacQuorn Rankine, chief among the founders of modern scientific engineering and thus one of mankind's greatest benefactors.

Some of the reasons that have prompted the initiators of the movement to enlist in it are as follows:

That since Rankine was chief among the founders of modern scientific engineering, he has been of incalculable service to engineering and thus also of very great service to all mankind. Hence he richly deserves not one merely but many fine memorials.

His writings have unquestionably played an enormously important part in the marvelous industrial development which has taken place in this country in the last fifty or sixty years and which has so fabulously enriched us; thus the United States is heavily indebted to Rankine and ought to honor him gladly and even eagerly.

There are memorials to many men whose contributions to the progress of engineering are not as impressive as Rankine's are but there is no real memorial to this great pioneer engineer anywhere in the world. In the United States there are a few portrait prints of him here and there, and that is all.

The proposed memorial to Rankine at the University of Glasgow would bring great honor to and materially increase the prestige of the engineering colleges and the profession of engineering in the United States.

For the college engineering students of the United States to do this fine thing would appreciably increase the prestige of the whole nation.

The individuals taking part in such an enterprise would thereby lay up for themselves a precious and abiding college memory of a worthy effort in behalf of idealism, culture, and Alma Mater.

The memorial would have valuable and timely international repercussions.

That these are good reasons and amply justify the movement, you will we feel very sure, agree.

WILLIAM H. RASCHE

Professor of Mechanism,
Virginia Polytechnic Institute,
Blacksburg, Va.

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